THE IRON AGE

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A Westinghouse Alternating Current Mill Motor.

The first squirrel cage induction motor designed particularly for use in steel mills and made a standard product for the market is the type MS motor recently developed by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Except for being heavier and stronger and embodying improvements in design and construction, the motor is similar to the Westinghouse type C motor. A squirrel cage induction rotor has the advantages of no sliding contracts leaving the bearings as the only parts subject to wear, and it can be designed with performance characteristics appropriate to the conditions of service in mill machinery, not only in steel mills but cement mills, stone crushers, brick making plants, &c. The motors are wound for three-phase 25-cycle circuits at 220 and 440 volts, and are made in nine sizes ranging from 5 to 75 hp. and speeds of 700 to 475 rev. per min. For intermittent service they can be considerably overloaded.

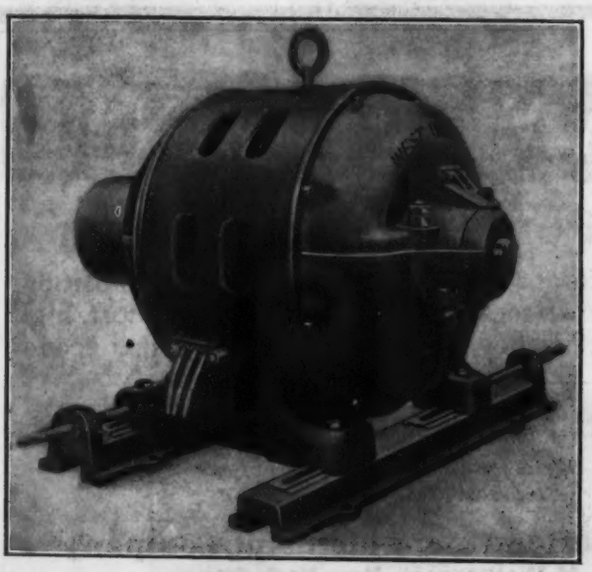

Fig. 1.—The Type M S Mill Motor Made by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

Construction.

Substantial, rigid construction has been especially aimed at in the type MS motor, a general view of which is shown in Fig. 1. The frame and bearing brackets are so formed as to protect the interior parts and still permit ventilation, which is further afforded through the numerous openings provided in the frame, which is a cylindrical iron casting with large supporting feet. The stator, or stationary primary, has a laminated core, assembled on horizontal ribs inside the frame and clamped between end rings. Rotary movement of the core is prevented by keys or dovetails, and the ribs support the core far enough from the inside of the frame to leave ample ventilating space; spacers provide ventilating ducts through the core. To the machined ends of the frame the bearing brackets are secured by bolts and through bolt holes in the feet the motor can be rigidly bolted to its foundation or to slide rails as shown in Fig. 1. The stator winding consists of form wound coils of heavy copper wire or strap laid in open core slots and secured by fiber wedges. They are further secured by binding to a heavy iron ring which prevents vibration.

The bearing brackets, of which a detail is given in Fig. 2, are heavy iron castings machined to fit the end of the frame, to which they are held by eight bolts, permitting them to be turned to the various angles necessary for wall, ceiling or floor mounting. Solid overhanging rims protect the windings, and four substantial arms support each bearing housing, which is cast solid with the bracket. Each bracket is divided horizontally and bolted together, so that it is possible to remove the upper part of the bracket without disturbing the lower half, as shown in Fig. 4, to give access to the interior parts.

The core of the rotor is also laminated and clamped between stiff end plates on a cast iron spider. Ventilating ducts are arranged in the core. To reduce the radius of gyration and make the motors easily reversible the core is of the smallest possible diameter and comparatively long parallel to the shaft. The rotor windings are placed in partially inclosed slots. The ends of the bars are bolted to end rings of heavy sheet copper of large ventilating surfaces, which are in turn bolted to the spider, making them rigid and removing stress from the ends of the bars; it is claimed that the bars and end rings cannot slip or vibrate even when the motor is quickly started, stopped or reversed.

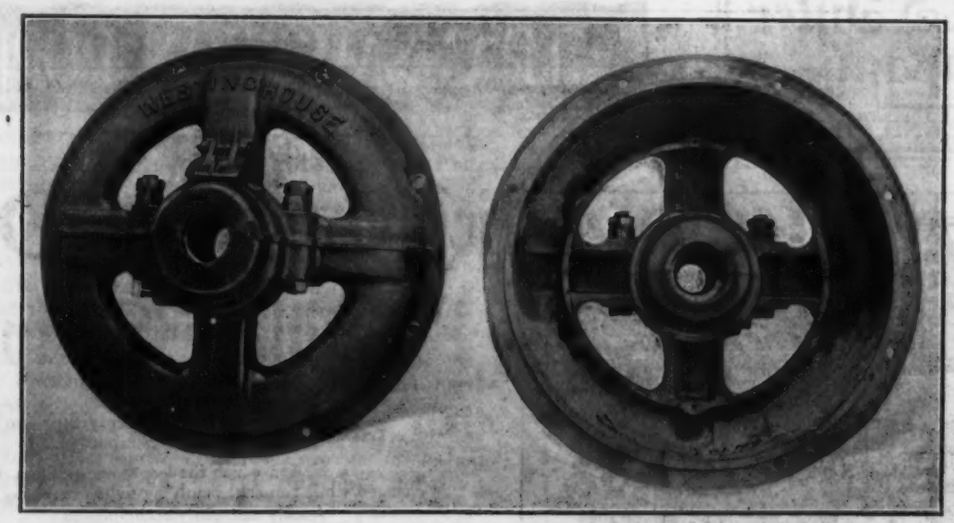

Fig. 2.—The Two Sides of One of the End Shields or Bearing Brackets.

The course of the ventilating air is through the openings of the bearing brackets, then outward between and around the ends rings and the ends of the windings on the rotor and stator, and also in through the rotor spider, and out through the ventilating ducts in the rotor and stator cores, finally leaving the motor through the openings in the frame, which gives a thorough distribution

and insures rapid heat dissipation. When operating conditions require it gratings or plates can be fitted over the openings in the brackets and frame, completely inclosing the motor, but under such conditions it cannot be operated continuously with as large a power output. The clearance between the rotor and stator cores is ample to insure long life of the bearings even in mill service, but due largely to other features of the design, good efficiencies and power factors are obtained.

Extra heavy axle steel shafts are employed which show no deflection under all loads within the motor capacities. Oil rings intercept and return the oil to the bearings which would otherwise tend to creep along the shaft. The bearings are very long and are rigidly supported in the housings. The shells are cast iron, split, and lined with babbitt metal, and are held by lugs, shoulders and bosses, so that no dowel pins are required to keep them from turning or shifting. Fig. 3 shows the parts of the bearing bracket with the bearing shells removed from the housing. To facilitate rebabbitting, lugs on the two halves of the shell insure centering, and the bearing can be poured from the side and the mandrel made with projections, so that the slots for the oil rings will be formed. The bosses on the shell facilitate clamping in the lathe for boring. The bearings are self-oiling and each has two oil rings. Through a spring covered opening at the top the rings can be inspected and the bearings filled with oil. Slide rails for either floor or wall or ceiling mounting with belt tension adjusting screws are supplied when required, and standard paper pulleys. All parts of the motor are made with special jigs, dies and templets, so that new parts can be quickly substituted for those broken and damaged. Two consecutive sizes have the same size frame, considerably reducing the number of stock repair parts required. Accessibility for inspection and repair is a strong feature of these motors.

Fig. 5.

Fig. 6.

The Type E Auto-Starter, Complete and with Oil Tank Removed.

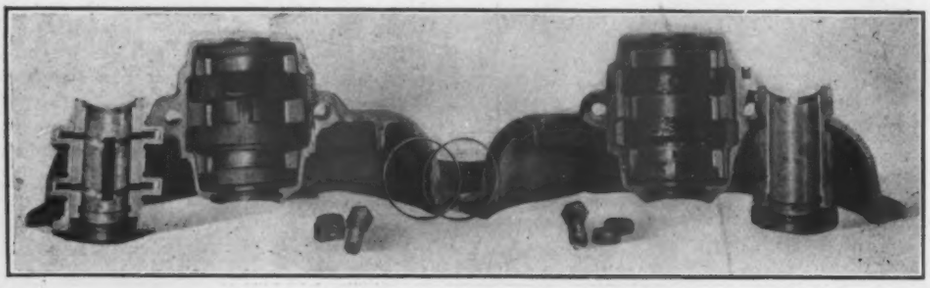

Fig. 3.—Parts of a Bearing Bracket Unassembled.

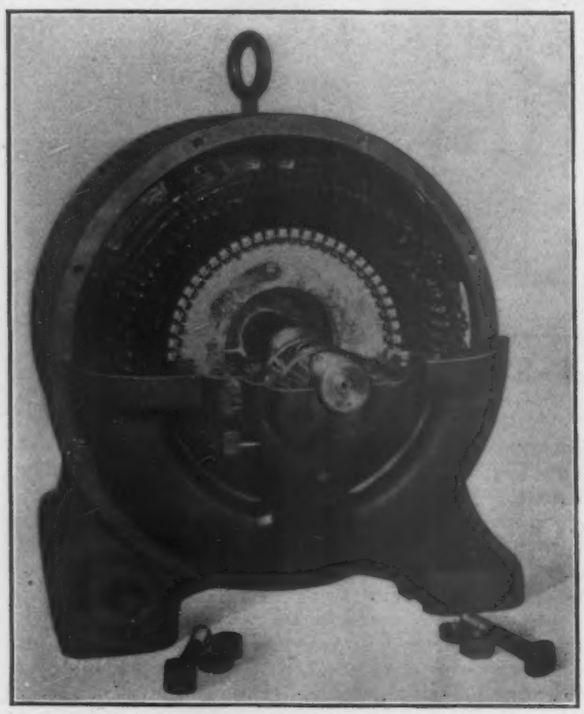

Fig. 4.—Motor with Upper Half of Bearing Bracket Removed, Showing Accessibility of Interior.

Operating Characteristics.

Squirrel cage induction motors are essentially constant speed machines; at no load the speed is synchronous and under load is less, the decrease being known as the slip. The greater the load the greater the slip, and the higher the resistance of the secondary winding the greater the slip at a given load. The greater the slip of an induction motor the greater is the starting torque for a given current. On the other hand, large slip is accompanied by increased losses and decreased efficiency. In the type MS motor the slip is high enough to give good starting torque without requiring excessive starting current, while at the same time good commercial efficiencies are obtained. The slip at full load varies with the size of the motor, being greatest in the smallest sizes. High starting torque renders these motors especially adaptable for the driving of heavy machinery of high standing friction and inertia, and high pull out torque makes the motors serviceable where subjected to heavy temporary overloads. These motors will operate at full output on circuits of which the voltage is within 10 per cent. of that at which the motor is rated. They will also operate at some variation from normal frequency, these allowable variations being greater with reduced output.

Starting Devices for MS Motors.

Means for obtaining the reduced voltage required in starting these motors is provided in the type E auto-starter shown in Fig. 5, and at the same time gives a starting current greater than the current taken from the line. The device includes two auto-transformers and a switching device with oil immersed contacts, and is self-contained in a cast iron case. The transformers are in the upper part and the switch mechanism is attached to the same part. The lower part of the case forms the oil tank in which the switch contacts are immersed. Fig. 6 shows the starter with this part removed.

The switch contacts, the only parts likely to wear out, are made of copper and brass rods, the tips of which may

be unscrewed and renewed. The switch lever has three positions—off, starting and running. A locking device holds the lever in the off position, and in the running position until released by pressing a thumb piece in the end of the handle. The handle will not remain in the starting position unless held there by the operator, and on being released returns at once to the off position. A mechanical device prevents moving the handle directly from the off position to the running position. It must first be moved to the starting position at the extreme left and then moved quickly back past the off position to the running position at the extreme right. If this movement is made too slow the handle will be caught and held in the off position. The purpose is to prevent the motor being thrown on line voltage if it has had time to slow down in speed beyond that allowable.

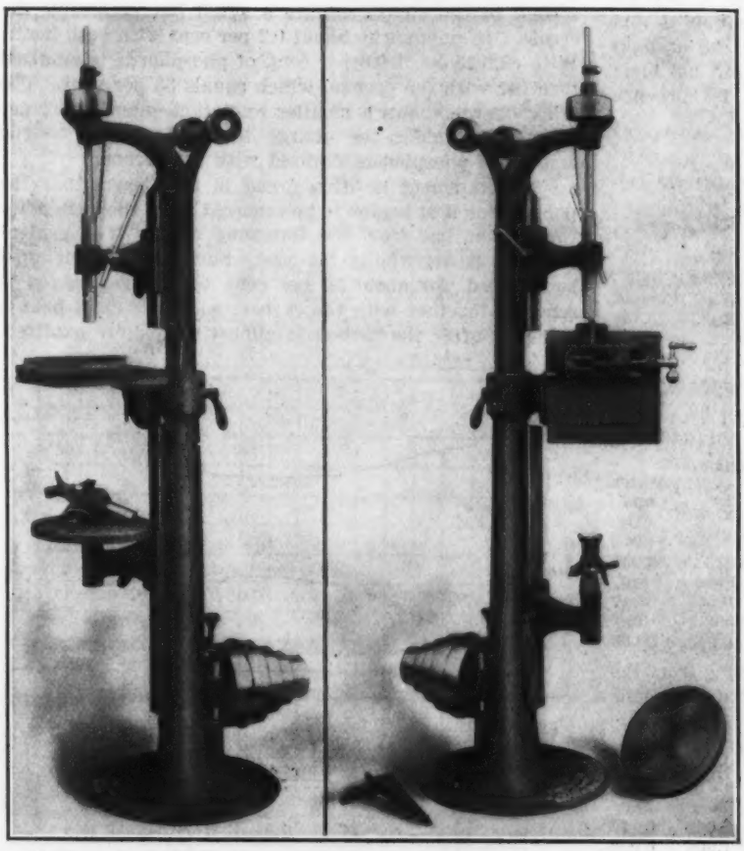

Fig. 1. Fig. 2.

Two Views of a New Sensitive Drill Built by the Rockford Machine & Shuttle Company, Rockford, Ill.

A number of the motors can be operated with one pair of auto-transformers if a separately mounted auto-starter switch is provided for each motor. It is the same switch practically as that described in connection with the auto-transformer mounted in a separate case, and is known as the type ES auto-starter switch. With motors of 20 hp. or larger, the type Q oil immersed auto-starter switch with an automatic overload protection can be supplied. It has similar automatic safety provisions to those in the type E starter, and has the additional feature of an overload tripping device which will open the circuit automatically in case of excess of current.

Manganese Sulphide and Corrosion of Boiler Steel.—In a paper before the Society of Chemical Industry, London, England, G. N. Huntley gave details of a case of pitting in a boiler. Each pit was found to be the center of a blister. The liquid inside the blister was a slightly acid solution of ferrous sulphate, while the boiler water was alkaline with caustic soda. The solid matter in the envelope of the blister, which consisted of a mixture of iron oxides, acted as a semipermeable membrane keeping apart the ferrous sulphate within and the caustic soda outside the blister. The theory given was that the particles of manganese sulphide, segregated in the steel, were oxidized by the oxygen dissolved in the boiler water to sulphuric acid and an oxide of manganese, the acid then acting locally on the surface of the boiler plate in the vicinity of the particles of manganese sulphide. This pitting of the boiler plate was prevented by adding sodium arsenite to the boiler water, the reagent taking up the dissolved oxygen.

A Rockford Sensitive Drill.

An improved sensitive drill has recently been perfected and placed on the market by the Rockford Machine & Shuttle Company, Rockford, Ill. In its design and construction several features have been introduced to facilitate the handling of work within its capacity. Notable among these is the square table, which swings around the column. Being pivoted to the clamp by which it is held, it is capable of adjustment to any angle, vertical or horizontal. It is also supplied with a supporting bracket on the top of the table, which obviates the necessity of strapping work to the table when drilling a hole at an angle. A vertical position of the table is shown in Fig. 2.

The round table on the lower bracket is vertically adjustable on the guides, which afford a maximum distance between the spindle and table of 41 in. This table is removable and may be replaced by the revolving center head with cup, crotch and point centers, as shown in Fig. 1. The latter attachment affords a convenient means of centering work of various shapes.

The spindle is driven from a four-step cone pulley attached to the base of the column; it has a vertical adjustment of 3 in., controlled by a screw, which serves to tighten the spindle belt. Suitable provision is made for taking up wear in the spindle, which is counterbalanced by a weight inside the column.

The principal dimensions of the tool are as follows: Distance of post to center of spindle, which is bored for a No. 2 Morse taper, is 7 in.; travel of spindle, 5½ in.; vertical adjustment of head, 9 in.; diameter of spindle (in sleeve), ⅞ in. The pulleys on the countershaft are 8 x 2⅛ in. and are designed to run at 470 rev. per min. The machine occupies a floor space of 22 x 28 in., and the net weight with the countershaft is 305 lb.

The New England Foundrymen's Association.—At the monthly meeting of this society, held at the Exchange Club, Boston, March 10, the question of the tariff on pig iron was taken up for discussion, a number of members expressing their views on the subject. Opinion being divided, no action was taken. The speaker of the evening was Prof. Bradley Stoughton of the School of Mines, Columbia University, who gave an instructive talk on the manufacture of pig iron, covering each phase of the process illustrated by lantern slides. The usual dinner was enjoyed.

At a mass meeting held in Hammond, Ind., preliminary steps were taken by manufacturers, business men and municipal officers to unite the cities of Hammond, Whiting, Indiana Harbor and East Chicago into one city under the name Calumet. The scheme would include some smaller places and give the new municipality an aggregate population of 75,000. With the new industries in prospect for the district this year it is believed the population will be 100,000 by 1910. The boundaries of the four cities now touch one another and they are practically one. It is believed that the cost of government would be greatly reduced by the merger. They all border on Lake Michigan. Gary is near by and could be included in the union of cities, but will remain apart.

The Basic Bessemer Process.

An Exhaustive Chemical Investigation by German Engineers.

F. Wuest and L. Laval, German engineers, have submitted the basic Bessemer process, as carried out in everyday practice, to a close experimental examination. The results are published in *Stahl und Eisen.** They give very interesting and valuable data concerning this process, both from a practical and theoretical standpoint, the results serving toward the formation of a balance sheet of the materials employed and the heat units and to the consideration of what changes would be brought about in the heat balance by the use of dry air, hot blast or blast enriched with oxygen. The paper is herewith translated in abstract:

Metal Analyses.

The weight and compositions of the materials employed in the charges examined are given in tables I and II.

Table I.—Weight of Materials.

Charge No. 1, Nov. 3, 1905. Material.	Pounds.	Charge No. 2, March 21, 1907. Material.	Pounds.
Pig iron	23,093	Pig iron	23,721
Lime	293	Scrap	617
Ferromanganese	154	Lime	3,880
Ferrosilicon	44	Ferromanganese	132
Spiegel	1,543	Steel	20,105
Steel	2,145	Ladle slag	6,658
Ladle slag	5,798		

Table II.—Analyses of Fluxes and Materials.

	SiO_2	Fe	Mn	Al_2O_3	CaO	MgO	P_2O_5	S	Water and CO_2
Lime	0.40	0.09	Tr.	0.19	85.10	Tr.	0.007	0.135	14.078
Dolomite	3.44	2.29	0.15	1.09	42.95	16.45	0.221	0.149	33.260

	Car.	Sil.	Man.	Phos.	Sul.
Ferromanganese	6.33	0.21	76.70	0.265	0.017
Ferrosilicon	0.00	48.33	0.38	0.037	Tr.
Spiegel	4.58	0.47	9.52	0.049	0.008

In table III are given the analyses of the pig iron, the finished steel, and the tests taken at different intervals throughout the blow:

Table III.—Analyses of Metal Tests.

Blowing time. Minutes.	No.	Car.	Sil.	Man.	Phos.	Sul.
	Charge No. 1.					
	Pig iron	3.354	0.481	0.85	2.009	0.177
0 to 1½	1	3.081	0.036	0.80	1.998	0.098
1½ to 3¼	2	2.624	0.006	0.42	1.910	0.120
3¼ to 5¼	3	1.934	0.007	0.41	1.866	0.128
5¼ to 6¾	4	1.321	0.009	0.45	1.786	0.128
6¾ to 8¼	5	0.733	0.010	0.55	1.735	0.128
8¼ to 10	6	0.094	0.005	0.52	1.436	0.112
10 to 11¾	7	0.034	0 000	0.55	0.526	0.067
11¾ to 13¼	8	0.015	0.009	0.34	0.117	0.084
13¼ to 15	9	0.016	0.013	0.23	0.066	0.077
	Steel	0.26	0.033	0.88	0.097	0.059
	Charge No. 2.					
	Pig iron	3.42	0.83	1.06	1.789	0.092
0 to 2	1	3.29	0.02	0.54	1.785	0.073
2 to 4	2	2.85	0.012	0.39	0.033	0.086
4 to 6¼	3	1.85	0.008	0.26	1.586	0.095
6¼ to 8¼	4	0.92	0.009	0.24	1.526	0.091
8¼ to 10	5	0.025	0.007	0.18	1.386	0.107
10 to 12¼	6	0.014	0.008	0.24	0.134	0.062
12¼ to 13¾	7	0.014	0.007	0.18	0.041	0.043
13¾ to 14¼	8	0.014	0.007	0.16	0.029	0.034
	Steel	0.16	0.007	0.26	0.050	0.040

The silicon shows a great difference in the two heats, being 0.48 per cent. in the first case, as against 0.83 in the second. In the first 3 min. it is oxidized to a mere trace, and from the third minute remains at about the same hight.

The manganese is lowered in both heats to about 0.45 per cent. in the first 3 min. From the third minute the manganese percentage changes in an essentially different way: With the first charge it keeps at about the same hight to the fifth minute; it then increases, as observed in 1879 by Windsor Richards, being supplied directly by reduction of the oxide of manganese. This reduction is most probably brought about by the phosphorus, which is certainly the case after the tenth minute, the manganese again increasing slightly in the bath from which the carbon has almost entirely disappeared.

* January 27, 1909, pages 121-133.

The sulphur acts about the same with both charges. It decreases with the first 2 min., especially in the first heat, which has a very high percentage to begin with. It then increases slightly, and again decreases after the tenth minute. The total desulphurization is about 56 per cent. in charge No. 1 and 60 per cent. in charge No. 2.

The carbon is slightly lower in the pig iron of charge No. 1, being 3.35 per cent., compared with 3.42 per cent. The slight loss in the first 2 min. of charge No. 2 is striking, and is undoubtedly due to the high silicon contained in this heat.

The phosphorus remains in both cases at the same percentage for the first 2 min.; then there is, from the second to the eighth minute a small but noticeable decrease. It amounts to about 0.2 per cent with both heats. With charge No. 1 0.6 per cent. of phosphorus is oxidized together with the carbon, which equals 33 per cent. The other charge shows a smaller oxidation—namely, 22 per cent. The colder the charge the greater will be the amount of phosphorus oxidized with the carbon.

The statement is often found in text books that the phosphorus first begins to be removed from the bath after the carbon, but from the foregoing results it is evident that this is not wholly the case. Such a statement must be rectified, for about 25 per cent. of the phosphorus is removed together with the carbon, while the chief part is attacked after the carbon is almost completely oxidized.

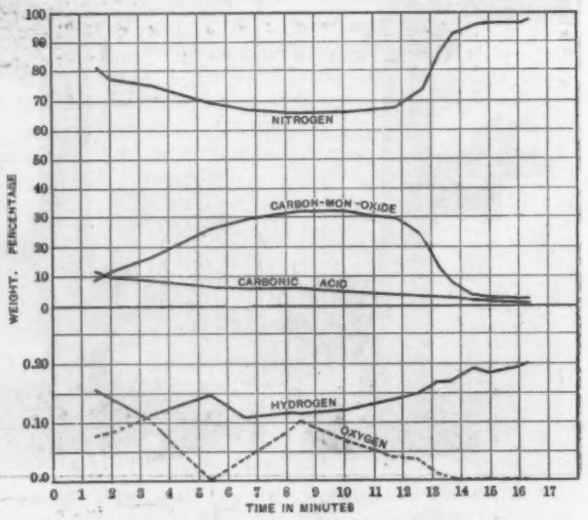

Fig. 1.—Composition of Converter Gases.

The last 75 per cent. of the phosphorus needs about 3 min. for its removal.

Slag Analyses.

In table IV are given the analyses of the slag tests:

Table IV.—Analyses of the Slag Tests.

Blowing time. Minutes.	No.	MnO	Al_2O_3	MgO	P_2O_5	SiO_2	CaO	CaS	FeO	CO_2+ H_2O
	Charge No. 1.									
0 - 1½	1	0.84	0.20	0.00	0.05	2.88	79.84	0.63	0.84	14.72
1½- 3¼	2	8.27	0.22	0.00	2.98	13.14	58.85	0.76	4.44	9.34
3¼- 5¼	3	5.04	0.20	0.00	2.48	7.74	67.20	0.51	2.04	14.79
5¼- 6¾	4	4.02	0.20	0.00	2.29	7.72	68.27	0.60	1.90	15.50
6¾- 8¼	5	2.81	0.23	0.00	2.96	4.98	69.93	0.70	2.32	16.07
8¼-10	6	5.89	0.26	0.64	5.40	12.25	62.95	0.72	4.65	7.76
10 -11¾	7	3.13	0.70	1.74	21.11	8.17	58.28	1.69	4.16	0.00
11¾-13¼	8	4.60	0.82	2.79	21.66	6.53	48.92	1.19	13.30	0.00
13¼-15	9	4.19	0.92	2.89	17.88	5.17	43.31	0.93	24.80	0.00
	Charge No. 2.									
0 - 2	1	3.75	0.27	0.52	0.66	8.00	68.3	0.37	1.31	16.10
2 - 4	2	5.72	0.33	0.81	2.26	8.80	65.1	0.42	2.64	12.81
4 - 6¼	3	4.74	0.34	0.64	2.87	6.89	63.0	0.53	2.90	17.31
6¼- 8¼	4	4.26	0.51	0.86	2.81	6.90	63.68	0.50	3.30	16.59
8¼-10	5	5.50	0 64	0.91	6.36	12.10	58.8	0.72	4.64	7.58
10 -12¼	6	4.86	0.70	0.98	19.64	8.74	52.46	0.56	10.24	0.25
12¼-13¾	7	4.72	0.72	2.87	14.80	6.34	49.88	0.18	19.20	0.61
13¾-14¼	8	4.23	0.57	2.89	11.57	6.05	47.82	0.18	25.58	0.86

At the beginning of the process the slag is not thoroughly molten, so that in the test ladle pieces of lime are removed covered with a thin coating of slag. The analyses of the first tests are, therefore, not altogether reliable. It can be seen, however, that in charge No. 1 the lime contents drop remarkably quickly from the first to the third minute. This is not only due to the formation

of silica but to the oxidation of considerable iron, owing to the cold condition of the charge. Then, owing to a reduction of iron and manganese back again into the bath by the carbon, the lime contents increase up to the

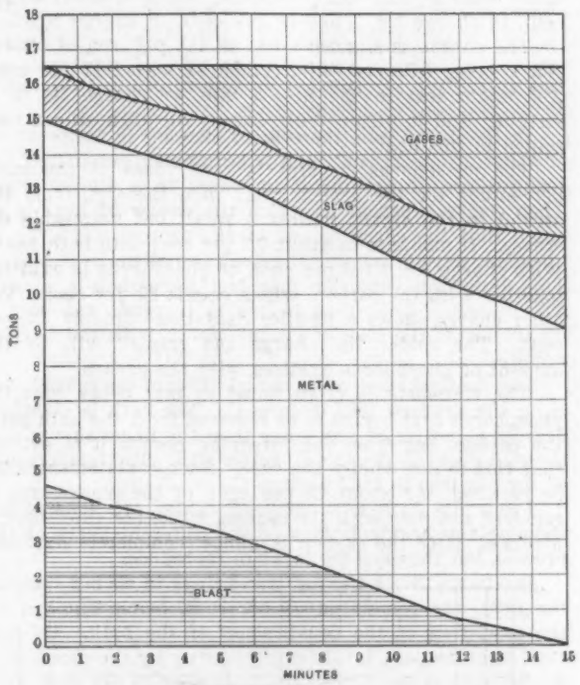

Fig. 2.—Balance of Materials in Charge No. 1.

eighth minute, when they again decrease, accompanying a clear gain in phosphoric acid. The P_2O_5 reaches its miximum in the twelfth minute, after which it is somewhat diluted in the slag, owing to a considerable oxidation of iron. The lime contents of the slags of charge No. 2 show a somewhat similar relation.

Concerning the oxide of manganese, the cold condition

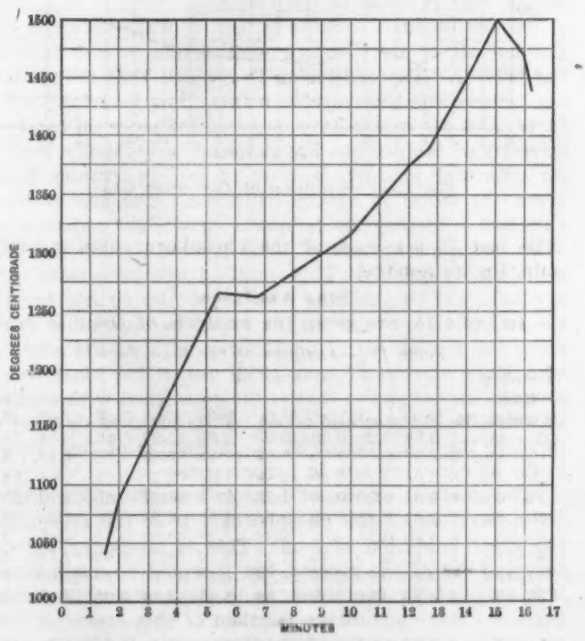

Fig. 3.—Temperature Estimations of Basic Bessemer Flame.

of charge No. 1 immediately occasions a considerable formation, as well as that of oxide of iron. A part is reduced back into the bath. Then follows a slight oxidation reaching a maximum in the tenth minute. It is again reduced back into the bath, from which, in the last 2 min., it is almost completely oxidized. The slags show more plainly than the metal the extraordinary part played by the manganese. In the third to the fifth minute its oxidation reaches a maximum whereby, in conjunction with the silicon oxidized at this time, the temperature of the bath is increased considerably. Now carbon reduces metallic manganese back into the bath. Through the progressive oxidation of the carbon the temperature of the bath sinks again, so that the blast again attacks the manganese, thereby increasing the oxide of manganese contents of the slag.

The manganese plays, therefore, the as yet unknown part of heat accumulator for the process. It burns at first and supplies, at this stage of the process, a great part of the necessary heat, whereby the temperature of the bath is considerably raised and is then reduced, and to some extent re-enters the bath. The procedure is united with a deficit of heat.

The silica contents of both charges show two maxima corresponding exactly with the oxide of manganese. It is very probable that the silicon plays a similar part to the manganese, which could be proved if the tests were taken at the right moment.

The course of the oxide of iron is very interesting and instructive. In charge No. 1 the iron is oxidized up to the third minute, then reduced and enters the bath. From the fifth to the eighth minute it remains constant at about 3 per cent., increasing in the tenth minute to 4½ per cent. Here is seen a slight reduction by means of the phosphorus. From the twelfth to the fifteenth minute it increases from 4 to 25 per cent. It also clearly shows in this heat that, like the manganese, the iron is oxidized and furnishes heat.

Metallographic Examination.

Corresponding to the change in composition, the structure of the metal also changes. This was followed by examining most of the metal tests from the two heats.

The pig iron shows three constituents: Cementite in needles, a pearlitic constituent, etching dark with dilute nitric acid, and occuring in rounded areas, and a ternary eutectic of ferrite, cementite and phosphide of iron, which is gray when etched with dilute nitric. Previous work of one of the writers had shown it to consist of about 2 per cent. carbon, 6.7 per cent. phosphorus and 91.3 per cent. iron.

In order to be sure in what condition the sulphur existed in a manganese free pig iron, a sample was prepared containing 0.405 per cent. sulphur and 3.65 per cent carbon. On examination the whole mass showed abundant well formed crystals, appearing gray to grayish blue after etching with picric acid. They are seen most plainly when surrounded by clear cementite. The pig iron of charge No. 1 shows similar crystals, which are rich in sulphur, as proven by the Baumann test. They are evidently the first to form, as shown by their definite shape.

With the gradual removal of the carbon from the bath there is left a material which should contain chiefly iron and phosphorus. It should, therefore, according to Stead, hold up to 1.7 per cent. phosphorus in solid solution. Test No. 6 of charge No. 1, with 0.094 per cent. carbon and 1.4 per cent. phosphorus ought, therefore, to give a small amount of pearlite and no phosphide eutectic. On the contrary, it showed a nonhomogeneous material, one part rich, the other poor in phosphorus. This is illustrated, as also the pig iron, by photographs.

With relation to the sulphur, the carbon free but yet phosphorus holding iron crystallizes before the sulphur compound, which is, therefore, found between the crystals. This is also photographed. Lastly a photograph is given of a sample with 0.5 per cent. phosphorus, which presumably should give a uniform structure. On the contrary, many small points of a dark constituent are seen, especially when the sample is etched with picric acid. These the author believes to be phosphate of iron, 3 FeO., P_2O_5.

The finished steel shows, as usual, pearlite and ferrite.

Balance of Materials.

In text books it is only possible to find statements concerning the changes which the materials undergo in the different stages of the process. Nowhere are the weights of the iron and the impurities given for any definite period. The authors now make the attempt to calculate from the tables the actual weights of all the materials at the different time intervals of the blow. The weights of the bath, the iron and other constituents are given in the original paper.

These results allow one to give the amounts of the blast necessary at the different times for the oxidation of the impurities and the iron. It must be remembered, however, that the moisture in the air and lime furnishes oxygen through decomposition. This may be calculated from the hydrogen in the gases. On the other hand, not all the oxygen is used, which again is found out from the gases. On this account it was necessary to obtain the analyses of the converter gases.

Composition of Converter Gases.

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Blowing time. Minutes.	Nitrogen.	Carbon monoxide.	Carbon dioxide.	Oxygen.	Hydrogen.
1½	80.53	8.71	10.53	0.075	0.155
2	77.12	12.17	10.55	0.083	0.134
3¼	75.32	15.84	8.64	0.120	0.119
5¼	69.48	24.92	5.48	0.006	0.143
5½	68.56	25.90	5.38	0.000	0.146
6¾	65.66	29.28	4.94	0.000	0.110
8¼	64.14	30.64	5.04	0.089	0.112
8½	64.08	30.92	4.78	0.107	0.111
10	64.86	31.46	3.46	0.076	0.122
11¾	67.30	29.72	2.74	0.046	0.141
12½	73.26	23.92	2.56	0.031	0.151
13¼	85.92	11.96	1.98	0.008	0.171
13¾	92.12	6.18	1.60	0.000	0.175
14½	95.60	3.10	1.16	0.000	0.194
15	95.02	2.77	1.03	0.000	0.183
16	96.55	2.40	0.65	0.000	0.196
16¼	97.40	2.00	0.33	0.000	0.203

Then follow calculations, the results being given in tabular form, of the weights of the different constituents of the converter gases of the two charges. The total weights are:

	Charge No. 1. Pounds.	Charge No. 2. Pounds.
Nitrogen	7,723	9.096
Hydrogen	15	17
Carbon monoxide	2,500	2,965
Carbon dioxide	538	619

The formation of a balance sheet of materials is now possible without great difficulty from the different tables. It is not shown in tabular form because of the enormous number of figures, but is given for charge No. 1 diagrammatically in Fig. 2.

The co-ordinates are time in minutes and material in tons (metric tons of 2204 lb.). It is assumed that at the beginning of the process the total amount of blast is supplied for the carrying out of the process. As the process continues, less and less blast is necessary, corresponding to an increase in the amount of gases produced. With this charge an original amount of air of 4.596 tons produces a total weight of gases of 4.888 tons.

The lime addition is 1.43 tons, while the slag at the end of the process reaches 2.63 tons. It must be remembered that the lime contains 14 per cent. carbonic acid and water, so the amount of slag forming constituents through the oxidation of the impurities has more than doubled. The metal has decreased from 10.48 to 9 tons, corresponding to a loss of 14 per cent.

The Heat Economy of the Process.

Next was undertaken the task of finding the amounts of heat stored up in the liquid pig iron and furnished by the oxidation of the impurities. The specific heats and the latent heats are very imperfectly known. They were estimated directly by observing the increase of temperature of a known amount of water when fluid material was added. The tests gave for pig iron 277 calories, for steel 336 and for slag 536, these figures representing the heat necessary to raise the temperature of the material and also to smelt it.

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Blowing time. Minutes.	Temperature. Degrees C.	Blowing time. Minutes.	Temperature. Degrees C.
1½	1,041	11¾	1,369
2	1,093	12½	1,389
3¼	1,155	13¼	1,412
5¼	1,251	13¾	1,438
5½	1,263	14½	1,475
6¾	1,260	15	1,499
8¼	1,287	16	1,467
8½	1,291	16¼	1,437
10	1,319		

In the first 5 min. there is an increase in temperature of about 200 degrees C., and it is to be supposed that the temperature of the metal increases in a similar way. Then comes a period in which the excess of heat is so small that the carrying out of the process would be in question, were it not for the heat stored up in the bath. This dangerous condition may last more than a minute. The excess of heat then begins to increase, reaching a maximum in the case of charge No. 2, with the twelfth minute.

The finished steel, after the addition of the spiegel, &c., is on the average 1552 degrees C. The bath is about 50 degrees C. hotter at any stage than the flame shows, and the slag about 25 degrees C. hotter still. The temperature of the pig iron is 1262 degrees C.

From the data now obtained tables are constructed showing the heat relations of the different parts of the process, but they are too large to reproduce.

In charge No. 1 the pig iron brings in 43 per cent. of the heat, the remaining 57 per cent. being supplied by the oxidation of the constituents of the bath. Of this total heat 24 per cent. is carried away by the gases, and is also used to decompose the moisture; 20 per cent. goes to the heating of the lime, and is carried away by the slag; 8 per cent. is lost by radiation, and the remaining 48 per cent. remains in the steel.

With the other heat the results are slightly different. Thirty-eight per cent. is brought in with the pig iron and 62 per cent. supplied by oxidation of the impurities. Twenty-five per cent. is carried away by the gases, 21 per cent. goes to the lime and the slag, 1 per cent. to melting the scrap, 11 per cent. lost through radiation and 42 per cent remains in the steel.

It now becomes possible to inquire what influence dry air, hot air or air enriched with oxygen would have on the process. The conclusion is reached that they would not remove the unfavorable points, thus insuring its future. Dry air would have no great influence on the heat economy of the process, but it would undoubtedly lead to an improved product, because of no opportunity being given the metal to absorb hydrogen. The use of blast enriched with oxygen is not a profitable undertaking. With the same amount of blast it would finish the heat a little more quickly. This small advantage is more than overbalanced because the heat would be so hot toward the end of the process that it would be impossible to remove the last traces of phosphorus without the sacrifice of a large amount of iron. The use of hot blast would give similar results to that of blast enriched with oxygen. It would be cheaper and could be advantageously used to increase the temperature at the beginning of the process if the silicon were low in percentage.

The greatest excess of heat is brought about during the separation of the phosphorus. It is the reason for the great oxidation of iron. This is necessary for the carrying out of the process, but it would be much better if it came at the beginning, as in the ordinary Bessemer process. Some advantage is taken of this excess of heat by adding scrap or lime briquettes, as in the Flohr process, but it still remains the chief objection of the basic Bessemer process.

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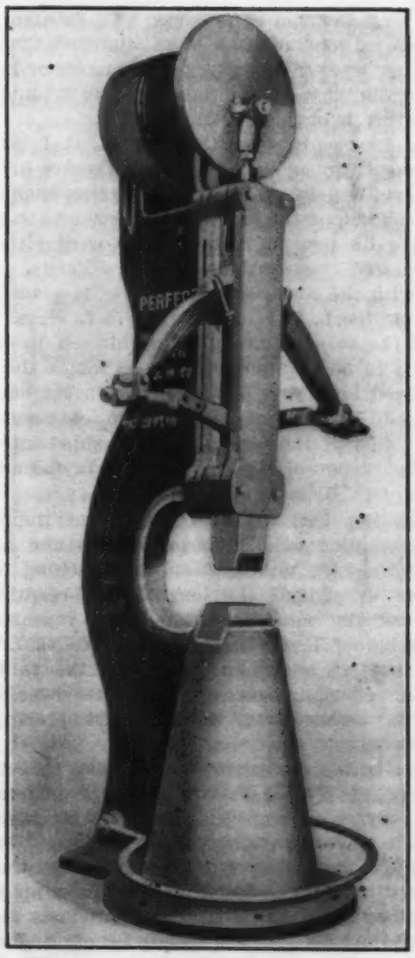

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In connection with these hammers there is furnished an attachment intended to assist in the sharpening of harrow and plow disks. A handle is furnished which passes through the hole of the disk and has a prolongation which is inserted in one of the holes in a flat curved steel bar, arranged to move freely from or toward the center of the hammer, to permit the disk to be hammered at the extreme edge or further toward the center, as may be required. Its outer end may be adjusted to suit yarying curves of disks. By means of the handle the operator can revolve the disk under the hammer. Also for this work there is furnished a special anvil with a curved face, so that there may be no risk of injury to the regular curve of the disk. The device may be quickly attached to the hammer, and its lowest support may be left in position when not in use.

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Until quite recently the antidumping duty has proved satisfactory to Canadian makers as a regulator of the price. Exporters from the United States were deterred from selling in Canada at bargain prices when it became necessary to hand over to the Dominion Government the equivalent of every concession made to Canadian importers from the regular price in the country of production. But the sharp cut lately made in the United States price of tin plates has affected the Canadian market detrimentally for the Canadian tin plate manufacturers. The cut price in the United States is now the regular price, and the antidumping duty is not serving as a check on imports from that quarter as it did before. Moreover, the antidumping duty helped British trade quite as much as it helped the Canadian manufacturing concern. When the selling of American tin plates in Canada at sacrifice prices was stopped by the imposition of the antidumping duty, Canadian orders that had formerly tended to go to the United States were in greater volume diverted to Britain. C. A. C. J.

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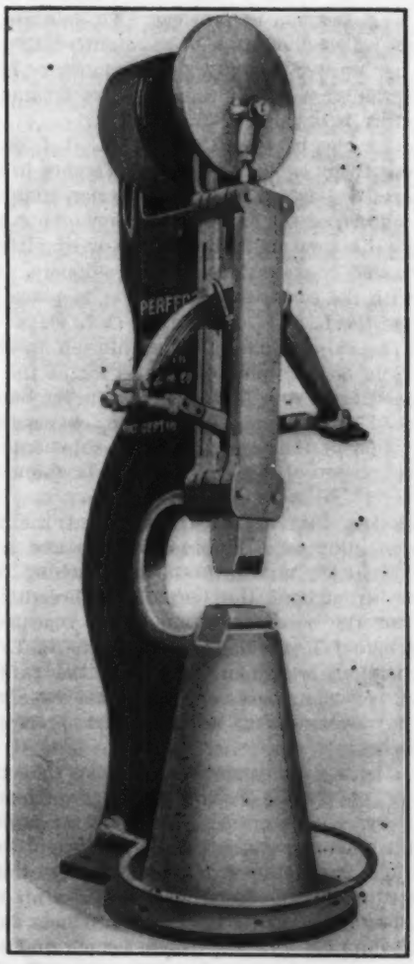

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Co-operative Freight Traffic.*

Carload Rates on Consolidated Shipments.

BY ALFRED H. POST, NEW YORK.

It cannot be expedient that the Government should assume the direct responsibility for the physical operation of our railroads. It is right and proper that the railroads should be owned and operated by the individual. The Government supervision of such corporations has come to stay, although wise and needed reforms may be accomplished as regards such supervision as it exists at present. The people of this country will not retreat on this issue. Our national Government will not take a step backward, guaranteeing as it does equal rights and liberty to all and favor to none.

Railroad Control by the National Government.

The railroads are merely the outgrowth of the old post roads system, the control of which by the State and Government is not to be disputed. Not only will our national Government exercise such control over rates and efficiency, but I predict eventually that no bond, stock or note issues will be made by railroad corporations without the approval of the central Government.

Our railroads must be for all time public service institutions and not operated from Wall Street, and when this guarantee of Government approval is given to railroad issues of stocks and bonds the general public, both at home and abroad, will be more willing investors in their securities.

From a traffic standpoint reasonable regulation must be extended to the railroads to permit their operating on a sound business basis.

The railroads have been the greatest instruments in the development of our country and the largest factor in the promotion of our interstate commerce, so of necessity, if they are not allowed to be successful in their operation and financial results, the community will eventually be the sufferer. I am confident you agree that we have had too many obnoxious State laws passed hampering most unjustly the railroads, and that you will further agree that State rights as regards transportation must be made subservient to national requirements. The Zollverein effecting the unity of the German States is a good example for our own States. Such issues as have recently occurred in our Pacific States are of equal interest to our Eastern States, and so it is with transportation. There should be no interstate legislation on interstate traffic. The national Government must be supreme in these matters.

To-day there is a bond or partnership existing in transportation in which the Government, the railroad and the shippers are each interested, and my belief is the relations of this partnership should be cemented for the future to the end that it will result to the general good of the community, for, as I have said before, on the success of the one depends the fortune and success of the other; it is a natural partnership and for all time should be an indivisible unit.

Carload Rates on Consolidated Carload Traffic.

There have been and are many important transportation issues which to-day are of paramount interest to the shipping public, but I do not intend to discuss many of these this evening; in fact, I shall largely confine myself to what I consider one of the most important issues as relates to the shipping of machine tools—namely, the application of a carload rate on consolidated carload traffic regardless of ownership so long as the other terms and conditions of the classification governing are complied with. In treating this subject two fundamental points will be firmly established:

1. That the question of ownership of goods does not, never has, or never should figure in the making of a classification or tariff for railroad rates.

2. That the refusal of railroads to apply a carload rate on a consolidated carload shipment simply on account of a diversity of ownership becomes and is an economic waste, wasteful alike to the railroad and the shipper—an economic wrong under our revised code of morals and which under our laws must become a legal wrong.

As I stated before, the railroads are merely the outgrowth of the old post roads system, and many of them at the time of receiving their original charter obtained from the Government numerous and valuable commissions and franchises and exercised by grace of that government some of the prerogatives of sovereignty, but with the sole and distinct proviso that they were to perform a public service and become a public utility.

Also, as has been said before, the railroads are entitled to a reasonable profit from their operation, but is it not correct to presume that when the railroads charge a higher rate for less than carload traffic (and we admit that they are justified in so doing on account of the increased cost per ton of handling such traffic as against the cost per ton of handling carload traffic) that they have based these L. C. L. rates by adding the additional cost per ton of handling, so that the net revenue per ton will be about on a parity with the net revenue per ton on carload traffic of the same class. To substantiate this argument, railroad officials have admitted that the net revenue per ton per car mile was as much or greater on carload traffic than on less than C. L. traffic, and the reason therefore is obvious.

The difference between C. L. and L. C. L. rates is or should be entirely equalized by the difference in the value of the services performed by the carrier, and therefore it is no concern of the railroad whether or not a shipper is able (by his own individual effort or by virtue of the assistance and co-operation of other shippers, or in connection with the services of an agent) to place his shipments from the L. C. L. class to the C. L. class.

After the shipper has qualified himself in the latter class he is in no different position as far as the railroad is concerned from any other shipper in the same class. The railroad performs no more nor no less service in the transportation of the combined C. L. shipments than in the transportation of the individual C. L. shipment.

Of Benefit to Railroads.

It was less than two years ago that the railroads were complaining of a shortage of cars and a lack of terminal facilities, and with the approaching return of prosperity throughout the length and breadth of this land is not the same condition to be repeated? The consolidating of L. C. L. shipments into C. L.'s would then become an additional benefit to the railroads in the saving of equipment, and of equal benefit to the shipper in guaranteeing security and promptness of transportation.

It is a matter of common knowledge that the fruit growers of the Pacific Coast, the stock raisers of our Western States, the green vegetable farmers of the South and numerous other food producers could not market their products at the great distances they do to-day were it not for the fact that they make up collective or consolidated carloads of their products, and this method of shipping becomes alike a benefit and source of revenue to the producer, the carrier (or railroad) and the consumer. Discontinuance of this practice would revolutionize such business and, of necessity, to the detriment of the small man—might we term him "the desirable citizen"?

It is well known also that throughout the Central and Eastern States numbers of people are continually moving West, especially farmers, and these people in moving their household goods and farming implements to their new home are in the habit of combining their shipments with one another, thereby effecting a saving of $200 and upward on a car; quite a considerable amount to the farmer, you will admit. This same saving is effected at no comparative net loss to the carrier, but with a guarantee of safer and quicker delivery to the shipper, as the possibility of breakage to L. C. L. shipments of household goods and furniture is very extreme.

Effect on Pacific Coast and Export Trade.

We will take an illustration in your own line of manufacture. From figures I have secured as to the

* Address delivered before the Cincinnati Branch National Metal Trades Association, March 11.

comparative weights and values of machine tools, I conservatively estimate the discontinuance of the privilege to consolidate carloads of machinery to the Pacific Coast will increase the laid down cost from 10 to 12½ per cent. You are all more or less interested in an export trade, and in selling your goods abroad more frequently sell one or two machines than a full carload. Your prices are based f.o.b. New York or Atlantic seaboard. If you are compelled to pay L. C. L. rates to seaboard, it means that at least 3 to 4 per cent. must be added to your cost of production, a serious obstacle, you will admit, in your race for the markets of the world in competition with English and German manufacturers.

These are only two illustrations, and many more could be given in your own line of manufacture, which would all forcibly illustrate that the discontinuance of C. L. rates on consolidated carload traffic would tend to the localizing of business and restriction of interstate and foreign commerce. The cost of transportation to the shipper or consumer is a method and means of production and therefore must be added to the cost of production. The increased cost of L. C. L. over C. L. rates increases the cost of production accordiugly, but still further in reality becomes a waste product whenever a shipment is refused the benefit of a carload rate if it is physically entitled thereto, regardless of ownership. Still further, while on this point, it becomes an economic waste, because, as before stated, the railroad does not or should not obtain any greatly increased net revenue on L. C. L. traffic as against C. L. traffic of the same commodity. In other words, there has been an illspent or wasted energy in the handling of L. C. L. traffic that could and should move in carloads. It is a loss to both shipper and carrier; again, I repeat, an economic waste.

The Practice of Other Countries.

There is just one further point that should be brought to your attention, namely, the contention of the railroads of their right to assess or charge a L. C. L. rate solely on account of the diversity of ownership. Our present Interstate Commerce act enforcing the equality in traffic, classifications and rates and prohibiting discrimination is modeled after the "equality clauses" of the English Railways' Clauses Consolidation act of 1845; in fact, this section of our act reads practically verbatim with that act.

It is a settled rule of interpretation that where a statute of another State or country is enacted in substance, it is presumed to be enacted subject to the interpretation put upon it by the courts of that State or country. It is a question throughout Europe to grant C. L. rates on consolidated carload traffic, even where there is a diversity of ownership. The tariffs provide for it, and it is a common and everyday usage which has been sustained by the highest tribunals of Europe. The rates and tariffs of the railroads of Europe are admittedly, and in this country should be, based solely on the question or matter or carriage or physical service performed, and not as regards the title or ownership of goods. To illustrate, there are right here in this city six large machinery manufacturers, known, I believe, as the "big six." Is it not preposterous to assume that if these same six manufacturers, through their combined efforts, are able to deliver at one time and place collectively a carload of machinery for export via New York, the railroads should not grant a C. L. rate to their agent who fulfills every condition and requirement of the tariff except as regards ownership?

In closing, I repeat the two prominent factors to be considered in the application of a carload rate on a consolidated carload shipment:

1. That the question of ownership was not considered in originally making railroad rates and tariffs, and does not to-day have any bearing on the question of a rate which is solely based on the physical service performed.

2. That the application of L. C. L. rates on shipments entitled to a C. L. rating becomes and is an economic waste; it adds no increased net revenue to the railroad, while on the other hand, it is an increased and unnecessary cost and expense borne by the shipper. Such being the case, I repeat that this economic wrong is, and should forever be, a legal wrong.

A Compressed Air Industrial Transportation System.

For 32 years compressed air has been used in the general transportation system of the Plymouth Cordage Company, Plymouth, Mass., whose buildings cover an area of 2500 x 1000 ft. The compressed air system is simple; no expert knowledge is required nor expert handling of the apparatus; no mechanic who has had any experience with steam finds perplexing details arising in connection with repairs, and the manipulation of the locomotive is readily acquired by an intelligent laborer.

The cost of repairs is very slight. The first locomotive at the Plymouth plant was purchased in 1876 and has been in active service continuously ever since, with a surprisingly small amount spent on it for maintenance. It is fair to say, however, that the work at the Plymouth Cordage Company is undoubtedly light in comparison with what it would be in a mine or metal working plant. Also that the method of using the air as regards pressure and some other details is open to criticism. These latter points, however, do not seriously impair the efficiency of the arrangement as a whole and are the natural outcome of a many times outgrown and expanded system.

The locomotives are charged at various points about the plant. The charging valves are located particularly with the idea of having the tank filled at the same time that the cars are being loaded or unloaded. Some of the runs are quite long, the longest being 2400 ft., and the round trip under favorable weather conditions is made with one charge. On this run a net load of 8500 lb. is carried and the cost of air figures 0.04 cent per ton per 100 ft. Other runs figure 0.08 cent per ton per 100 ft. This cost is based on a cost of ½ cent per 100 cu. ft. of free air and includes all charges up to delivering the air into the mains at 200 lb. pressure; these figures are on the conservative side. The system as a whole, taking lump figures, moves 1 ton, net load, 100 ft. for approximately 1 cent. This includes the air used for all other purposes, fixed charges on all the rolling equipment as well as compressing apparatus, and all attendance.

Air Compressor Lubrication.

There is always danger where oils are used for lubricating air compressor cylinders, especially where the poorer grades of oil are employed. Many accidents have been due to an explosion in the receiver or pipe line caused by the vaporiziation of lubricating oils. There is also apt to be more or less trouble from the formation of hard carbon deposits. Instances are on record where it has been necessary to shut down and chisel the carbon deposit off the piston and relief valve. By using Dixon's flake graphite and oil fed by means of a Graphoil lubricator, troubles with carbon deposits and dangers of explosion, it is claimed, are reduced to a negligible quantity. Instead of oil some have used soapsuds with flake graphite and have secured satisfactory results. If a small quantity of Dixon's flake graphite, No. 635, is put with the oil into the hand oil pump on the steam line, a little of the mixture can be conveniently supplied at various times. The booklet, "Air Compressor Lubrication," published by the Joseph Dixon Crucible Company, Jersey City, N. J., contains valuable information on the subject of air compressor cylinder lubrication, besides suggestions for the best way to feed the graphite.

Gulick, Henderson & Co., engineers and founders, 439 Third avenue, Pittsburgh, have been engaged by the County Commissioners to inspect all the structural material of the new bridge to be erected near Monongahela City, Pa. The Fort Pitt Bridge Works, Pittsburgh, is furnishing the steel, and an inspector will be located at its plant in Canonsburg, Pa., during the fabrication and assembling of the parts.

The Standard Oil Decision at Chicago.

Judge Anderson, in the United States Court at Chicago last week, decided that the prosecution had failed to make a case aganist the Standard Oil Company, involving shipments over the Alton Railroad. The jury was ordered to return a verdict of not guilty, without hearing any evidence from the defense. The court decided that the Government witnesses had failed to show that there was a legal 18-cent rate per 100 lb. on oil, from Whiting to East St. Louis, or 19½ cents from Chappell to St. Louis, and therefore the Standard Oil Company could not be convicted for having paid 6 and 7½ cents, respectively, on the shipments. This was the second trial of the famous case in which Judge Landis, two years ago, imposed a fine of $29,240,000. Another case of the same character, involving shipments over the Burlington Railroad under the same conditions, has never been brought to trial, and will now be dropped by the Government.

The Facts Shown in The Iron Age.

In a "Review of the Facts" in *The Iron Age* of August 6, 1908, it was shown that there had never been a specific tariff in effect, making the 18-cent rate on which the prosecution was based. Two witnesses for the Government, employees of the Interstate Commerce Commission, constructed such a rate by using three documents—an old class rate tariff between Chicago and East St. Louis, to which the Alton was a party, an "application sheet" of the Alton which made Whiting take Chicago rates, and the Illinois classification. The old tariff in this chain made the fifth class rate 18 cents, and the Illinois classification rated oil as fifth class. The Alton road, however, had made a commodity State tariff from Chicago to East St. Louis, which named a 6-cent rate, and the shipments were made on this tariff. None of these documents was filed with the Interstate Commerce Commission by the Alton road, excepting the "application sheet," which merely made Chicago rates apply to Whiting, without naming any rates. The Alton did not make rates to St. Louis from Chicago, as its general practice was to make all tariffs to East St. Louis, and these tariffs were not filed with the commission. After reviewing the essential facts in the muddle, it was stated in *The Iron Age:* "It has been widely heralded that there was a legal rate of 18 cents; but in the evidence this rate existed only in the opinions of two witnesses." It was also shown that the Illinois classification, not having been filed with the Interstate Commerce Commission by the Alton road, could not be legally used in constructing the alleged rate of 18 cents, and if this document was ruled out the case would fall. Judge Anderson has taken this view of the facts, holding that the Illinois classification was not admissible as evidence. Strange to say, the eminent counsel for the Standard Oil Company did not attack the legality of the 18-cent rate on this ground, neither in the first trial nor in their arguments before the Circuit Court of Appeals.

The Real Merits of the Case.

A multitude of commodities is carried between Chicago and East St. Louis at rates varying from 4 to 8 cents per 100 lb., these rates applying to all the "common points" like Whiting, around Chicago. It is the universal custom of the railroads in this territory to make special commodity tariffs for freight that, like petroleum, runs into the thousands of cars annually, and the commodity rate of 6 cents which the Alton made in its regular manner was a reasonable rate. Since the Whiting refinery was established, in 1891, all shipments to East St. Louis had paid approximately that rate, on other roads as well as on the Alton. One competing line, the Chicago & Eastern Illinois, had a tariff on file at Washington, which made a rate equivalent to the Alton rate, so the shipper in this case had no motive whatever for rigging up the preposterous deal that was charged in the Alton case of maintaining a legal rate of 18 cents and carrying the freight at 6 cents. It was not shown that any other shipper had ever paid, or had ever been asked to pay, 18 cents. While the Alton tariff was not filed with the Interstate Commerce Commission, the "application sheet" was supposed to cover and authorize it, and hundreds of other commodity tariffs were made and used during the same period by the Alton and other roads, on all kinds of commodities, under parallel circumstances.

An Amateurish Job.

It was, on the whole, a decidedly amateurish job for the Government investigators to attempt to run the gauntlet of the Federal courts with so flimsy a case against a shipper. The railroad might have been prosecuted successfully for failure to comply fully with the law which regulates the filing of tariffs, but this method of making rates was quite generally followed by the railroads without any question being raised by the Interstate Commerce Commission, until this prosecution was undertaken.

The commission now prescribes definite rules for commodity tariffs, which are followed without question by the railroads. The Government attorneys at Chicago obeyed orders from Washington in prosecuting the shipper rather than the railroad, and it was due chiefly to their ability and the stringent rulings of Judge Landis that the case attained so much notoriety. Judge Landis was apparently in accord with the new theory of corporation law which was then popular at Washington, a theory that a corporation is not entitled to the constitutional rights of a living man when charged with crime.

R. L. A.

The National Association of Jobbers of Wrought Pipe and Fittings.—The Executive Committee of this new organization met in Pittsburgh, March 10, and elected the following officers: A. E. Ford, Ford & Kendig Company, Philadelphia, president; Chas. H. Simmons, John Simmons Company, New York, first vice-president; Otto H. Felix, Pittsburgh Supply Company, Pittsburgh, second vice-president; Chas. G. Cornell, Jr., Cornell & Underhill, New York, treasurer. The secretary will be selected at an early day and will likely be one who is now serving in this capacity for another prominent jobbers' association. The next meeting is subject to call of the Executive Committee, which consists of the first four officers and six additional members at large, selected from various parts of the country. As an indication of the importance of the new association, there were present at the first meeting representatives of every tube, valve and fittings manufacturing plant in the United States.

The Gandy Belting Trademarks Upheld.—The Circuit Court of the United States for the Western District of Pennsylvania, in the case of the Gandy Belting Company, Baltimore *vs.* C. A. Turner, Inc., of Pennsylvania, has entered a decree under which an injunction has been issued restraining the latter from infringing or in any way violating the rights of the former. For the purpose of identifying its belting as of its own manufacture and to distinguish it from that made by others, the Gandy Belting Company has for 35 years painted or dyed the belt red, and, in addition thereto, has stamped upon the belt, at every 10 ft., a distinctive trademark consisting of a coil of belt with a bale of cotton laid across it and the words, "Gandy's Belt," and also the words, "Genuine Gandy Belt."

The American Shipbuilding Company has closed contracts for three lake freight boats to be built for Eastern interests, whose names for the present are withheld. The boats will be of the 9000-ton class, 624 ft. long, 54 ft. beam and 30 ft. deep. They will be built at the Lorain yard. Work will be started on them at once and they will be ready for delivery in the latter part of the summer. This contract makes orders for 13 boats booked by the American Shipbuilding Company for 1909 delivery. Of these, 10 are bulk freighters, one is a package freighter, one a small passenger steamer and one an oil barge.

The furnace plant of the Sheffield Coal & Iron Company, Sheffield, Ala., is being put in repair for operation within 60 or 90 days.

The Climax Centering Lathe.

Cold rolled or finished shafting, or rough or unfinished bars can be quickly and accurately centered and countersunk in a centering lathe, Fig. 1, built by the Climax Company, Hyannis, Mass., and sold by the Fairbanks Company, Boston, Mass. Its essential features are a hollow spindle with double chuck, a counter rotary movement of work and drill and a hinged steady rest having a convenient locking device.

The head spindle runs in suitable bearings and is

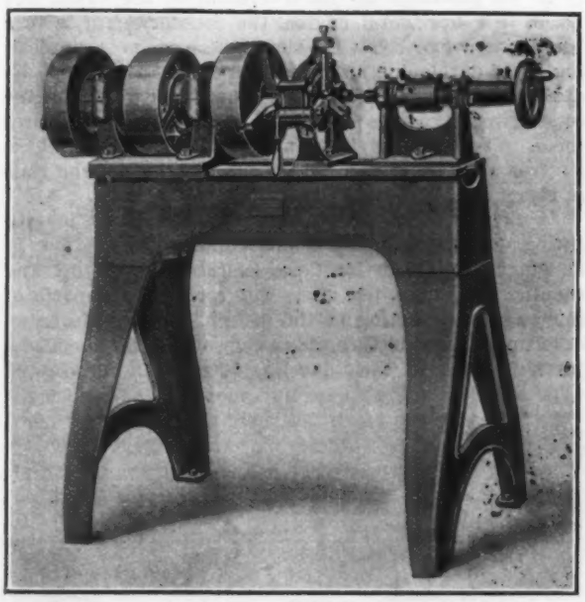


Fig. 1.—The Hollow Spindle Counter Rotary Climax Centering Lathe.

fitted with two universal chucks and a pulley for turning the work slowly in the reverse direction of the revolving drill to insure accurate centering. The tailstock has a revolving steel spindle running in bronze bearings and carrying a combination countersink and drill. The centering spindle has 2-in. longitudinal movement, actuated by a hand wheel and screw, or a lever movement may be substituted. The tailstock can be adjusted for centering finished stock kept central by a steady rest, or rough bars held only in the universal chucks; the rest is not required for this latter class of work, and the tailstock is moved along the bed to a convenient position in front of the inner chuck. For centering finished bars requiring extreme accuracy the drill stock is set as far as possible from the inner chuck, with the steady rest intervening to centralize the end of the bar. Only one chuck need be used in connection with the steady rest. The rest is hinged at the back, and controlled at the front by the cam, operated by a handle, the several positions of which are shown in Fig. 2. Thus in centering short pieces of either rough or finished stock one end is held firmly in the jaws of the inner chuck, while the other revolves in the rest, which when closed is securely locked by the cam. The drill runs at 600 and the chucks at 25 rev. per min. The floor space is 24 x 36 in., and weight 550 lb.

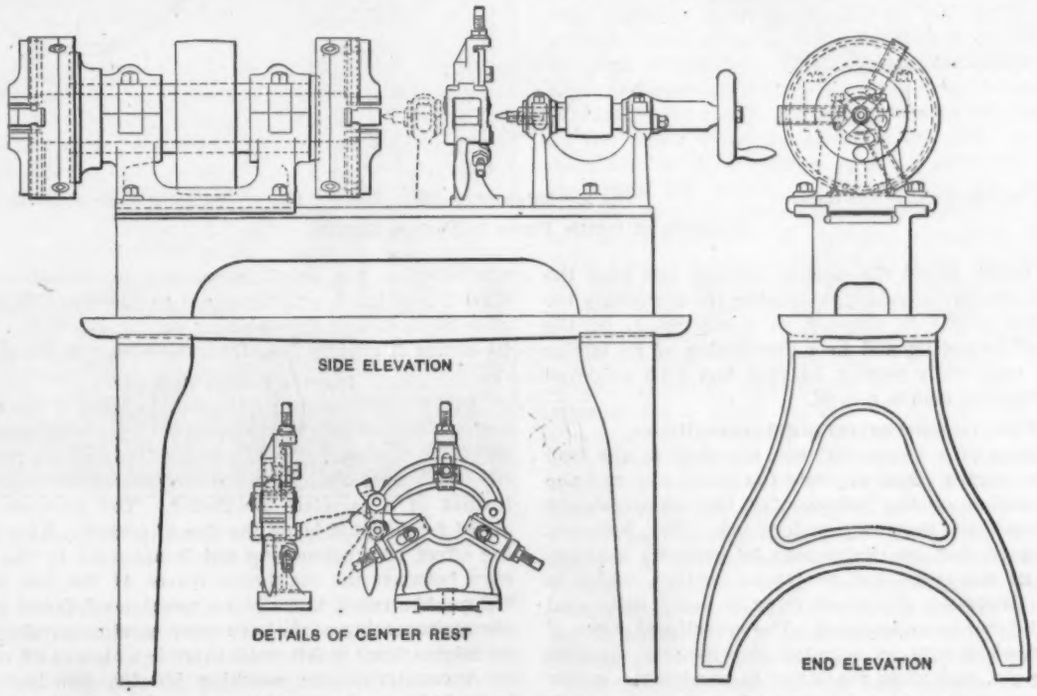


Fig. 2.—Side and End Elevations and Details of the Steady Rest of the Climax Centering Lathe.

Damages for Breach of Contract for Iron.

In a suit to which W. J. Holliday & Co., Indianapolis, Ind., and the Highland Iron & Steel Company, Terre Haute, Ind., were parties the Indiana Appellate Court has rendered a decision that where a contract for the sale and purchase of "650 tons of bar iron, assorted hardware specifications," in lots and at prices as stated, without mention of a condition or purpose that it should be specially manufactured to fill the orders as given, was entered into between the owner of a rolling mill who had long been accustomed to manufacture bar iron of sizes and in quantities to fill special orders of its customers and a dealer who had long been such a customer and in the habit of obtaining iron from the seller upon such special orders, the relation between the parties and their established practice affords grounds for applying to a breach of such contracts by the customer's refusal to give any orders, the rule as to the measure of damages which governs where a contract is made for the manufacture of an article not then in existence and the contract is annulled by the buyer before its execution is entered upon. The rule is that the difference between the cost of production and the contract price is the measure of damages. Judge Roby dissented on the ground that a seller of a commodity that has a fixed market value, like iron, cannot alter the rule of his damages for breach of a mere contract of sale by reason of manufacturing as well as selling, nor by taking orders in advance, and that the difference between the contract price and the highest market price between the breach and the date fixed for delivery is the legal measure of damages.

Traffic through the Manchester Ship Canal in 1908 amounted to 4,582,496 tons, a falling off of 481,313 tons from 1907. Earnings last year were £506,975. The canal now has a depth throughout of 28 ft.

Steam Engine Counterbalancing.

BY F. H. BALL.

The tendency of modern engine design is toward higher speed, especially for engines which must be installed in close quarters, as in office buildings, hotels, &c. Frequently the question as to whether a building should supply its own light and power and utilize the exhaust steam for heating, or whether it should buy current and also spend nearly as much as before for coal for live steam heating, finally resolves itself into the possibility of getting all the machinery required into the limited space available in the basement. Where engines are installed in buildings of this character it is also essential that they be balanced so that vibrations may not be communicated to upper floors and adjoining buildings.

The question of engine balancing has received exhaustive study, especially in marine engines and locomotives. For the two-cylinder locomotive the best that is possible is a more or less unsatisfactory compromise between a tendency of the engine to oscilate sidewise or "nose," and a tendency of the wheel to leave the rail during a part of every revolution. In vertical cylinder marine engines of two or more cylinders the effects of vibration can be largely corrected, although not entirely unless bob weights are employed. It is surprising that the case which offers the easiest solution has been the last to be attacked—namely, balancing the stationary engine. This article is devoted to a discussion of the problem of balancing and to a description of an engine in which practically perfect balance has been achieved by exceptionally simple means.

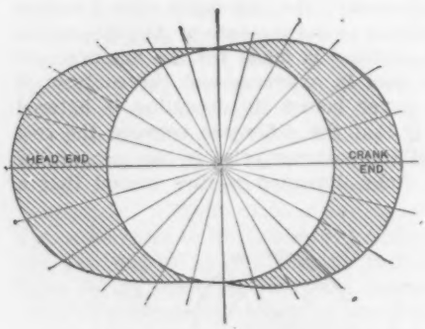


Fig. 1.—Unbalanced Single Engine.

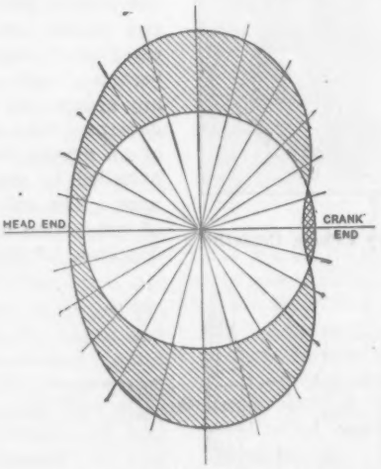


Fig. 2.—Balanced Single Engine.

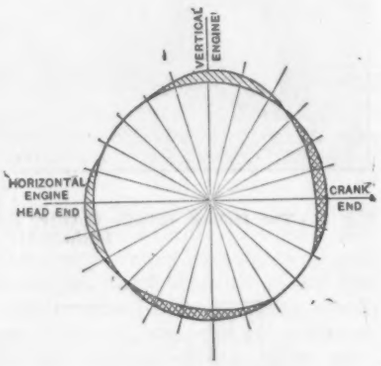


Fig. 3.—Balanced Angle-Compound Engine.

Diagrams of Inertia Forces in Various Engines.

What Counterbalancing Accomplishes.

The effect of a counterbalance attached to the heel of a steam engine crank opposite the crank pin, and the fixed limitation of the influence of the counterweight are subjects not generally understood. For instance, many suppose that an engine may be perfectly counterbalanced at one speed and not so at another, which is not true. However, the whole thing is easily calculated and not difficult to understand. The centrifugal force of a counterweight acts on a radial line directly opposite the crank pin, and when the latter is passing the center the counterweight opposes or neutralizes the unbalanced force due to the starting and stopping of the reciprocating parts.

Were there nothing else to consider except the counterbalancing of the reciprocating parts at the center where the greatest need of counterbalance is felt, the problem would be simple, for it would only be necessary to determine how much counterweight would exactly neutralize the unbalanced force at the centers. Unfortunately, the problem is more complicated for two reasons:

First, because of the angularity of the connecting rod, the rate of acceleration of the reciprocating parts is much greater when passing one center than the other; therefore, a counterweight that exactly neutralizes the unbalanced force at one center is too heavy or too light, as the case may be, at the other center. The effect of a connecting rod of the usual length is to increase the force at one center about one-sixth, and reduce the force at the other center about the same amount, making a difference of about one-third between the smaller and the larger force. This is inevitable and it is plainly impossible to perfectly counterbalance an engine even on the line of centers unless a connecting rod of infinite length is used.

Second, the counterweight exerts its full force radially at all positions in the revolution of the shaft, and when, in a horizontal engine, the counterweight is in a position above or below the shaft, there are no reciprocating parts developing an equivalent force in the opposite direction, and, therefore, the centrifugal force of the counterweight causes a violent unbalanced up or down force. The counterweight on the driving wheel of locomotives actually causes the wheels to lift from the rails at every revolution when the speed is very high.

A clear idea of these forces may be had by investigating, for instance, the counterbalancing of a 16 x 14 in. simple American Ball engine, rated at 160 hp. and running at 250 rev. per min. The reciprocating parts of this engine, consisting of the piston and rod, the crosshead and the connecting rod, weigh about 550 lb. These parts, because of their inertia, develop an unbalanced thrust when the crank is passing its center of about 6900 lb., which is exactly equal to the centrifugal force of a mass of 550 lb. revolving on the shaft and having its center of gravity 7 in. from the center of the shaft.

Inertia Forces Compared.

Fig. 1 would represent the inertia force of the reciprocating parts of this engine with no counterbalance. The length of that part of a radial line lying within the shaded area would represent the unbalanced force at every instant of a complete revolution. The greatest unbalanced force would be on the line of centers. The modifying effect of a connecting rod is apparent in the difference between the maximum forces at the two centers. Near mid-strokes there is no unbalanced force, because the reciprocating parts have their maximum velocity and no inertia force is felt until there is a change of velocity.

A counterbalance weighing 550 lb., attached to the heel of the crank, with its center of gravity located 7 in. from the center of the shaft and directly opposite the crank pin, would neutralize or counterbalance the inertia thrust of the reciprocating parts when passing the line of centers of the engine. Fig. 2 represents the inertia forces under these conditions and is typical for all single horizontal engines. The effect of the counterweight is to transfer the maximum unbalanced force into a vertical direction without any diminution in magnitude whatever, so that the maximum forces are not neutralized, but are merely transferred from horizontal to vertical. Because of the modification due to the connecting rod, a small unbalanced force is still felt on the line of horizontal

centers, but instead of being a reciprocating force it is directed toward the cylinders at both centers. When the crank is passing the center toward the cylinder the acceleration of the reciprocating parts is too great for the counterbalance, and hence an unbalanced force toward the cylinder is developed by these parts, while at the opposite center the acceleration of the reciprocating parts is too little for the counterbalance, and hence an excess of centrifugal force produces an unbalanced force toward the cylinder also. While this constitutes good counterbalance at the point of otherwise maximum unbalanced

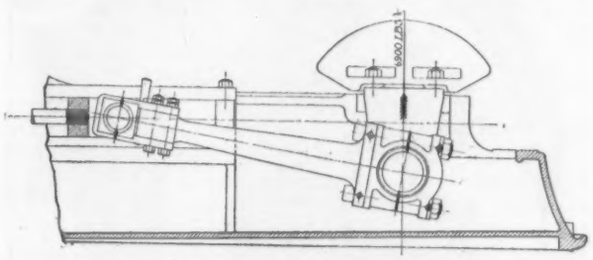


Fig. 4.—Partial Elevation of a Single Engine, Showing the Unbalanced Vertical Force.

thrust in a single horizontal engine, and while it would eliminate any tendency to shake horizontally on the foundations, if there was nothing to neutralize this thrust of about 3½ tons, the engine and foundation would tend to hop up and down 250 times per minute.

The 6900 lb. of centrifugal force of the counterweight is a constant force and always exerted on a radial line outward from the center of the shaft. Thus, in the posi-

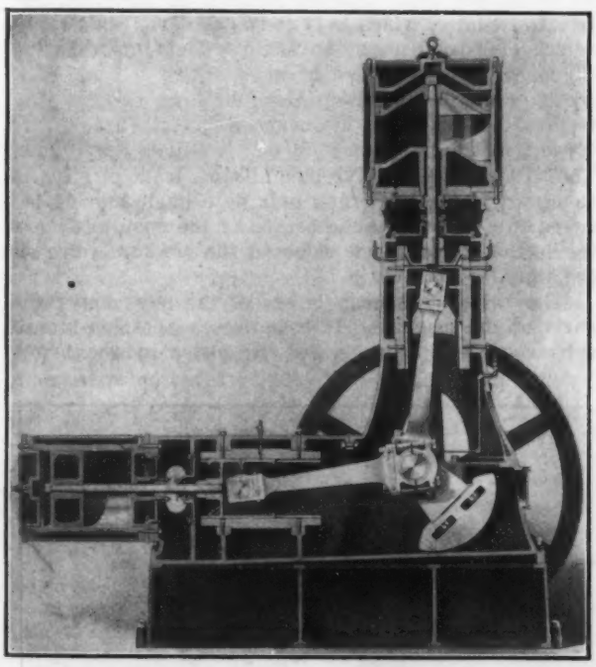


Fig. 5.—Sectional Elevation of an American-Ball Angle-Compound Engine.

tion of the crank shown in Fig. 4, the direction of the centrifugal force is on a vertical line, as indicated by the arrow. The only opposite force is from that part of the connecting rod that develops centrifugal force on the crank pin. The balancing of these opposing centrifugal forces at this point leaves an excess of about 6000 lb. in the direction of the arrow. This is felt in a downward direction when the counterbalance passes the lowest point, so that the counterbalancing of the reciprocating parts in a horizontal plane has developed a reciprocating vertical thrust of about 6000 lb., which alternates vertically in its direction 250 times a minute. Fortunately, this violent force is in a direction most easily resisted by the foundation, as it does not tend to rack it, and the mass of masonry and iron is too great to be shaken seriously in a vertical direction, and particularly so because the broad surface between the earth and the foundation is very unyielding. Yet this violent force is highly undesirable, as it creates friction at the shaft bearings and strains the parts unnecessarily.

The Angle-Compound Engine.

A very practical method of correcting this fault of a reciprocating engine is to combine two engines on the same crank pin having the high pressure and low pressure elements at 90 degrees from each other in the plane of the cranks rotation, as in the American-Ball angle compound engine* (Fig. 5), for in this way the fault of each engine is made to neutralize the same fault in the other. The horizontal engine is counterbalanced on its line of centers, but is badly out of balance in a vertical plane. The vertical engine is balanced in its vertical line of centers, but if considered apart from the horizontal engine is badly out of balance horizontally. The relation of these engines to each other is such that the same counterbalance serves perfectly for both engines. With the crank at its lowest position, the heavy vertical thrust due to the centrifugal force of the counterweight is neutralized by the inertia of the vertical reciprocating parts. The same balancing occurs again when the crank has advanced 90 degrees to the line of horizontal centers, only in this case the horizontal engine, instead of the vertical, is balanced by the counterweight, so that at four points in each revolution the counterbalancing is perfect, and between these points the overlapping of the forces of the two reciprocating parts maintain approximately a perfect balance. Fig. 3 is a diagram of the unbalanced inertia forces in such an engine having a counterbalance of sufficient weight to neutralize the mean inertia force of the reciprocating parts of either engine on its line of centers. The slight unbalanced forces are due to the effect of the connecting rods, already explained, but they are unimportant and easily absorbed by the mass of the engine. The forces are represented for an engine of 160 hp. capacity, the same as the simple single engine from which Figs. 1 and 2 are taken.

Incidentally the angle compound construction affects a saving of floor space. It occupies only about as much floor space as a simple engine of half the power, and gives a steam economy equal to that of a good tandem or cross compound. There is another feature of the angle arrangement—namely, a more even turning moment exerted on the crank. A piston exerts no turning moment on the crank when the latter is at either center, and, moreover, while the piston exerts a powerful thrust on the crank pin during the first half of the stroke, the pressure drops so much during the latter half that there is little turning effort as the crank approaches the center. With two cylinders at right angles, the maximum turning effort of one cylinder comes just about at the time of the least effort of the other cylinder and the two help each other out, so as to produce a nearly uniform turning effort throughout the revolution. There are several practical advantages in this. The maximum stresses for a given horsepower capacity are reduced. The more equal turning moment is also desirable where such machinery as looms, spinning machinery, &c., is driven directly by a belt, or a rope drive, while in the case of electrical machinery it is beneficial with alternators, particularly when driven in parallel, reducing the amount of power wasting and otherwise useless cross current required to keep the alternators in step. With an engine having an uneven turning moment it is impossible to eliminate this cross current unless the two generating units fall into step exactly in the same phase of the revolution—that is, the two cranks must run in parallelism. It is practically impossible to attain this condition regularly in practice. More even turning moment also makes it possible to reduce the weight of the flywheel, which in connection with the reduced maximum thrust for the output decreases considerably the pressure and wear on the bearings.

The Carnegie Steel Company recently placed an order for two 10-ton electric cranes of 75 ft. span, to be installed in the yards of its Ohio Works at Youngstown. The cranes are of special design.

* Described in *The Iron Age*, February 27, 1908.

A Swiss Portable Electro-Hydraulic Riveter.

BY DR. ALFRED GRADENWITZ, BERLIN, GERMANY.

There are three classes of portable riveting machines —hydraulic, pneumatic and electric. The hydraulic method, owing to the incompressibility of the pressure fluid, affords the advantage of bringing a nonyielding pressure to bear on the rivet which can be maintained for any length of time. However, it involves accessories that require attention and take up space. The pneumatic method, owing to the elasticity of the pressure medium exerts a resilient pressure on the rivet. The latter is thus likely to become loose if the plates or sheets joined are not fitted together closely enough. The pneumatic machine likewise requires accessories. The electric schemes so far brought out have the disadvantage of bringing the pressure to bear on the rivet only temporarily. The time during which the energy stored in a swinging mass is used up for the compression of rivets

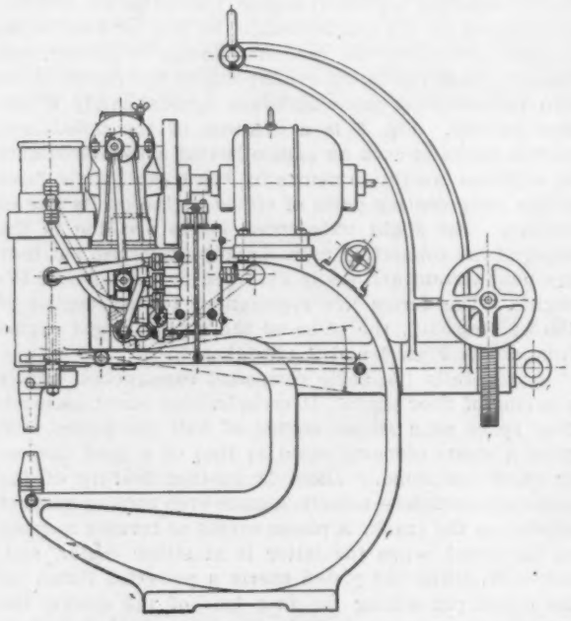


Fig. 1.—Line Elevation of the Oerlikon Electro-Hydraulic Riveter in Normal Position.

is insufficient to effect a perfect riveting, the rivet requiring a longer time to cool. An advantage of this method, however, is its small first cost, accessories, except for current supply being dispensed with, and it is easily transported and electric power conveniently supplied. The idea of combining the hydraulic and electric methods to realize their advantages and their drawbacks resulted in the electro-hydraulic riveting machine recently brought out by the Oerlikon Machine Works, Oerlikon, Switzerland.

Fig. 1 is a line drawing of this machine, Figs. 2 and 3 are views of it in two other typical manners of suspending it, and Fig. 4 shows a section of rivets driven with it.

The cast steel upright of this machine has a jaw width of 29½ in. and a hight of jaws of 15¾ in. Its lower arm carries in front the riveting tool, while the upper arm, designed as pump body, carries in front the press cylinder which is lined with cast iron. The compression piston is of steel, and is differential, its effective diameter being 6 5-16 in., while the differential diameter is 5½ in. The piston speeds in ascending and descending accordingly vary at the ratio of 4.3 to 1. At the top and bottom the compression piston is packed with leather sleeves, and it is prevented from twisting by vertical guides. The bottom of the piston is a tool holder and is offset from the center line of the piston to allow rivets to be compressed as closely as possible to the profile iron legs.

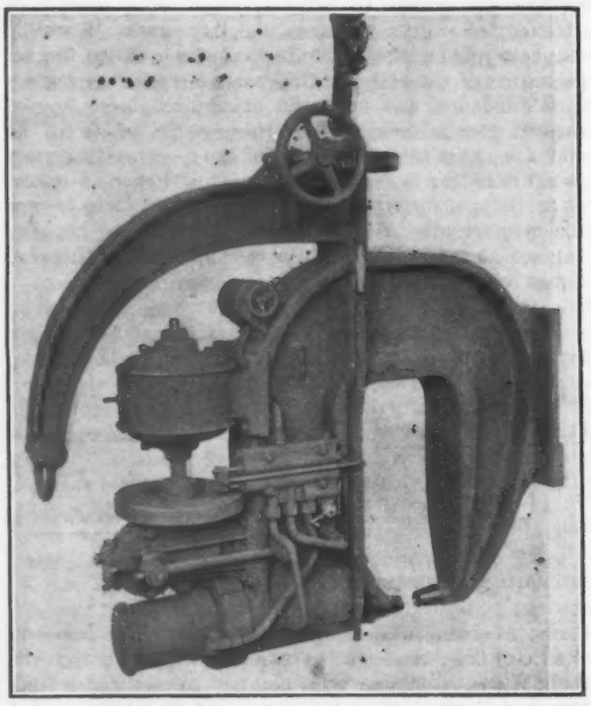


Fig. 2.—The Riveter Suspended to Rivet a Horizontal Seam from the Top.

The tank above the cylinder receives the liquid (a 40 to 45 per cent. aqueous solution of glycerine, the freezing point of which is 17 to 25 degrees). This reservoir is closed outside by an airtight float, thus allowing the machine to be worked in any position.

The pump is a differential piston pump and its body is fitted to the frame by means of metal bushes. Its capacity is 2¼ gal. per minute at 170 strokes per minute. The stroke is 2⅜ in. The pump piston, made of steel, is connected to the two crank rods by a guide moving between two beams. At the bottom of the pump body are the suction valve on one side and the pressure valve on the other.

The valve mechanism is one of the most important parts of the machine. It comprises a phosphor-bronze valve chest with its ports and two piston rods with five

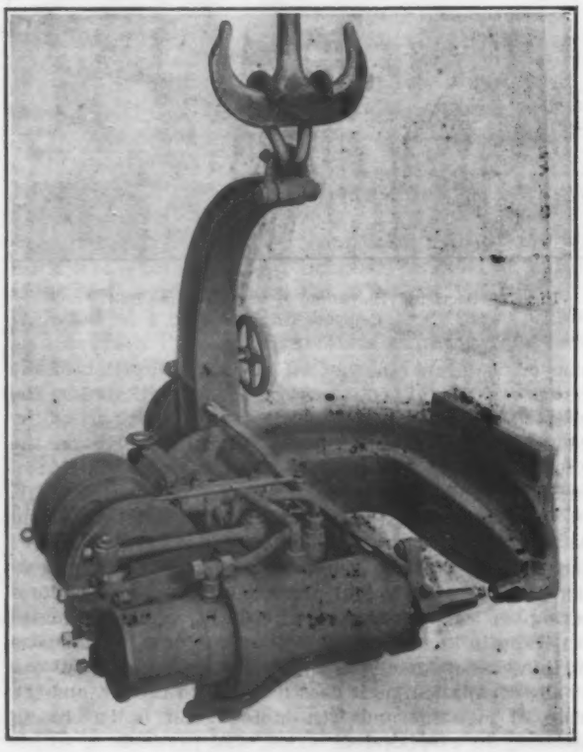


Fig. 3.—The Riveter Suspended to Rivet a Vertical Seam.

valve pistons actuated by the distributing lever. The pistons are ground to fit accurately. Through the valve mechanism the distributing lever controls the pressure liquid and thereby the movement of the compression piston. The lever is pivoted on the frame and has a front extension, allowing the machine to be controlled automatically by the pressure piston to "no-load" operation, on the ascending motion of this piston. A valve at the bottom of the valve mechanism allows the piston pressure to be adjusted in accordance with any rivet dimensions. This valve at the same time acts as a safety valve, releasing at a pressure corresponding to the maximum riveting diameter. Both the suction and pressure pipes are copper.

The pump is driven through two cranks and worm gearing by an electric motor mounted on the frame. Between the motor and worm gear is a disk clutch. The motor is controlled by a switch mounted on the frame.

The hanger is cast steel, and may be turned on a pivot fixed on the cast steel frame by a hand wheel and worm and worm wheel. Near the pivot is another suspension ring, making possible other positions of supporting the machine. In addition to the positions shown the machine can be suspended from the hanger turned so as to place the motor and pressure piston underneath. The

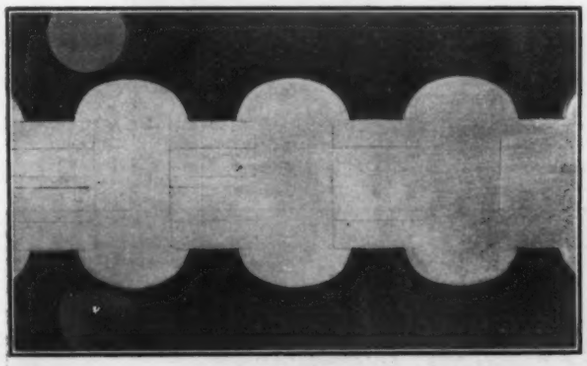


Fig. 4.—A Section Through Rivets Driven with the Oerlikon Electro-Hydraulic Riveter.

rivet in this position is inserted on the top, its head being compressed from underneath, which is specially convenient in many cases.

The machine is designed for a piston pressure of 40 tons, a piston speed of 16½ in. per minute in a downward and 71 in. in an upward direction; the stroke is 2⅝ in. The motor is 4 to 5 hp. at 1420 rev. per min. The maximum diameter of rivet handled by the machine is 1 in. The valve mechanism allows the pressure to be left on the rivet for any length of time. The motor, which runs in one direction, need not be thrown out or reversed during the riveting. All that is required during the operation of the machine is to handle the distributing lever. The machine is compact and weighs about 1.25 tons.

The first electro-hydraulic riveting machine of this design has been in operation since September in one of the large Swiss iron construction shops, where it has driven as many as 1000 20-mm. (0.79 in.) rivets in 10 hr., with the labor of only three men; formerly five men were required to do half as much work in the same time.

Cementing Powder for Hardening Steel.—Leaflets issued by the Roessler & Hasslacher Chemical Company, 100 William street, New York, describe the uses of Ferrodur, a cementing powder for hardening iron and steel, and Intensit, a powder for hardening in open fires. It is claimed that in some cases soft steel cemented with Ferrodur may be employed as more economical than cast [crucible] steel. Various advantages are cited as resulting from this substitution. The articles to be cemented are treated in a cast or wrought iron box, the inside of which has first been covered with a thin layer of fireclay. On the bottom of the box a layer of charcoal dust is placed, then the powdered Ferrodur, on which the pieces to be cemented rest. The spaces between the pieces are also filled with the same powder and the pieces themselves covered with it. The box may be filled up with charcoal or with powder which has been used before, and is then exposed to heat. A high degree of hardening is secured. Ferrodur is also offered as a tempering powder for the treatment of tools which by repeated heating have become decarburized on the surface. In using Intensit it is suggested that it be strewn on the pieces when red hot, so as to cover the whole of the surface which is to be hardened, the piece or tool being then replaced in the fire. A second and third covering with Intensit with intervening heating in the fire precede quenching in cold water.

The Clark Tumbling Barrel.

Desiring a machine particularly adapted for tumbling small brass and iron castings, finished screw machine products, tempered springs, &c., the Clark Novelty Company, Rochester, N. Y., designed and built a tumbler for its own use. It did the work so satisfactorily that

A New Tilting Tumbling Barrel Made by the Clark Novelty Company, Rochester, N. Y.

the company recently decided to place it on the market.

The barrel may be adjusted to revolve at any angle and may be emptied and refilled while in motion. The crank and ratchet pawl are located where they may be operated conveniently. The entire machine is strongly built and extra heavy at certain points where strength is required. The shafts and bearings are long and heavy, especially the carrying bearings of the barrel, which has an extra long and heavy shaft. The barrel is 20 x 20 in., and the machine itself occupies very little floor space. The barrels are made in three styles—of cast iron, sheet steel and wood. Those made of cast iron and wood are decagon in shape. It is claimed that the machine embraces all the best features found in other similar machines and that it includes several improvements.

The Austro-Hungarian Syndicate reported an output of 47,920 gross tons of manufactured iron and steel in January, or 3890 tons less than in January, 1908. The total of bars and small shapes was 22,736 tons; beams, 9322 tons; plates, 7711 tons, and rails, 8251 tons.

The Utilization of Waste Heat in a Malleable Foundry.

Ordinarily it would be considered foolish to install two machines to do work which could easily be accomplished by one, and yet to a certain extent this is what many users of furnaces for metallurgical purposes are doing. The requirements of a melting furnace for a malleable castings plant are such that the products of combustion must leave the furnace at a very high temperature; in fact, above the melting point of cast iron. This means the loss of a large per cent. of the heat units in the coal. The coal must be paid for, and if the owners can realize on the heat units thrown away by the reverberatory furnace, they will secure similar economies to those which have long been practiced with rolling mill puddling and heating furnaces.

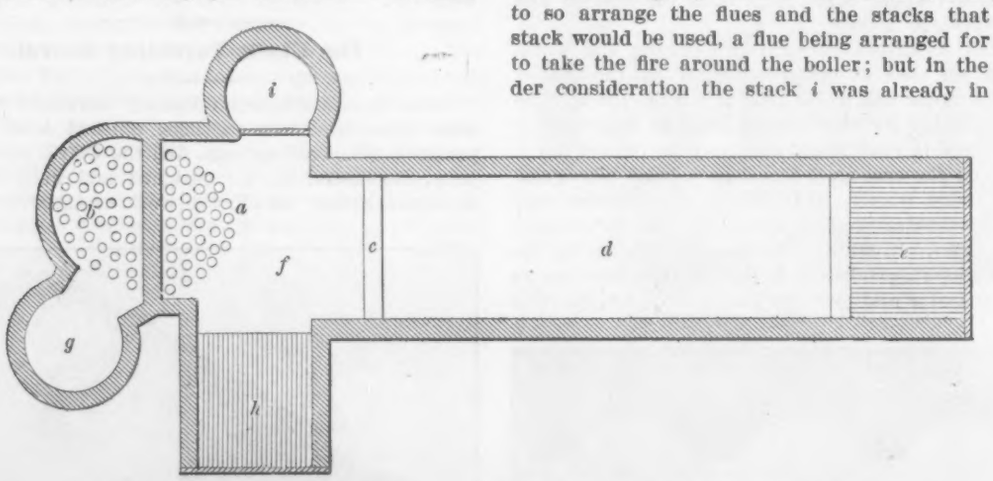


Fig. 1.—Plan of Reverberatory Furnace, Waste Heat Boiler and Auxiliary Firebox.

Fig. 2.—View of Reverberatory Furnace and Emergency Stack.—Wall of Auxiliary Firebox at the Left.

The Buhl Malleable Company, Detroit, Mich., appreciating the possibility of saving in this direction, installed a waste heat boiler of 250 hp. capacity for use in connection with one of its malleable furnaces. The boiler is of the vertical water tube type, the fire ascending on the side *a* and descending on the side *b*, as indicated in Fig. 1. The back bridge wall of the furnace is at *c*, the furnace hearth at *d*, and the furnace firebox at *e*. When the boiler is in use the flame passes from the firebox through the hearth, over the bridge wall to the combustion chamber at *f*, which is located between the back bridge wall and the boiler. Thence the flame ascends through the flues on the side *a*, descends on the side *b* and passes to the stack *g*. These conditions are maintained when the furnace is in operation. When it is necessary to shut down the furnace for charging, fire is started in the auxiliary firebox, located at *h*, and so situated that the flame passes into the combustion chamber *f* through the boiler and up the stack *g*.

If the boiler has to be shut down for repairs or for other reasons, a temporary damper placed at the back of the firebox *f* turns the flame from the malleable furnace into the emergency stack *i*. It would be easily possible to so arrange the flues and the stacks that only one stack would be used, a flue being arranged for a by-pass to take the fire around the boiler; but in the plant under consideration the stack *i* was already in existence and it was deemed wise to make the boiler equipment entirely independent of the malleable furnace.

A general view of the front side of the furnace is shown in Fig. 2, and it will be noticed that the top of the furnace is horizontal to a point over the back bridge wall. A series of bungs are arranged on an incline, so that the flame rises toward the boiler. This incline gives a greater hight and forms the combustion chamber shown at *f* in Fig. 1. A portion of the wall of the auxiliary firebox is seen at the left of the view given in Fig. 2.

In the practice at the Buhl Company's plant the fire in the furnace is started at 3 o'clock in the morning and allowed to burn with natural draft until 6 a.m. At that time the blast is put on and the fireman in charge of the boiler arrives. About 11 a.m. the first heat is tapped.

At 11.30 the second heat is charged, and during this operation, in the half hour from 11.30 to 12, it is necessary to use the auxiliary firebox. The second heat is tapped about 4 o'clock in the afternoon, and immediately thereafter the furnace is charged for morning, so that during the last half hour of the day it is once more necessary to use the auxiliary firebox. By charging the furnace at night it is only necessary for one man to come at 3 a.m. Whenever the furnace is shut down for repairs a sheet iron damper is lowered between two of the bungs over the back bridge wall *c*, thus cutting off the furnace from the combustion chamber *f*.

The heat derived from this one melting furnace is sufficient to run the machinery connected with the plant, which includes quite a large machine shop. It is probable that in many operations as now conducted in foundries the melting equipment could be so arranged that much of the waste heat could be used in a way similar to that described above.

Razing Steel Structures with the Oxy-Acetylene Torch.

In the reconstruction of the New York terminal of the New York Central & Hudson River Railroad, in connection with the recent electrification, it became necessary to raze the old train shed. In this work successful application was made of the process of cutting metals by means of oxygen gas, using one of the portable oxy-acetylene welding and cutting plants manufactured by the Beltzer-Delcampe Welding Company, Bridgeport, Conn.

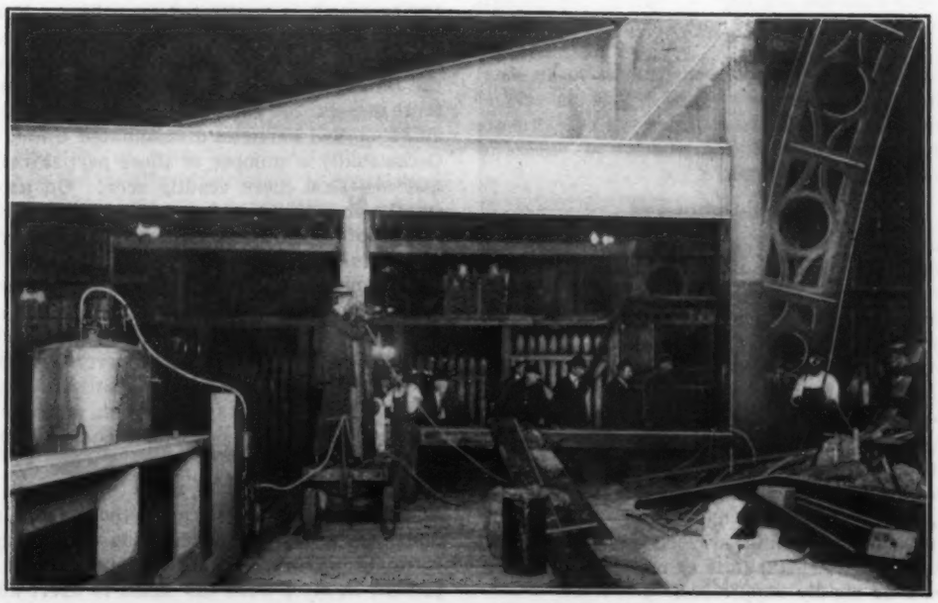


Fig. 1.—Beltzer-Delcampe Portable Oxy-Acetylene Welding and Cutting Equipment Used in Cutting Off the Steel Arches of the Old Train Shed in the Grand Central Station, New York City.

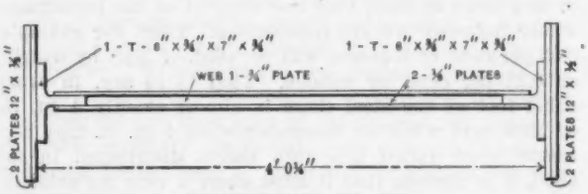


Fig. 2.—The Section Cut.

Fig. 3.—The Work in Progress.

The use of the blow pipe made possible the cutting off of the arches at the level of the concourse, thus effecting a saving. The bases of the arches were built into the concourse and were partly covered by the brickwork of the station walls, and older methods would have necessitated removing considerable of this concourse and brickwork, as may be judged from Fig. 1. In this view the acetylene generator is shown at the extreme left and the oxygen generator near the center of the view; both were placed on trucks. Acetylene from the back pressure safety valve shown on the board between the generators and oxygen from the oxygen reservoir were led to the torch through rubber tubing.

The sketch Fig. 2 shows the section of the arch at the base, and Fig. 3 shows the blow pipe in operation. In order to cut in such restricted quarters it was necessary to secure a small, light, blow pipe, which would operate in any direction from the operator; in other words, it must be single tipped. The blow pipe manufactured by the Beltzer-Delcampe Welding Company was admirably suited for this work. After making each cut the upper part of the arch was removed, the bottom part remaining as a filler. This bottom part was then covered over with a thin layer of concrete to the level of the concourse.

Hiram Percy Maxim announced last week, on his return from a visit to Washington, that the United States Government had made its first purchase of the Maxim gun silencers, though he did not state how many this order included. It is reported that Spain, France and other of the large European powers are interested in the new invention, and that King Alphonso of Spain liked the device so well after trying it in France that he is having his personal Mauser fitted with a silencer.

Causes of Weakness in Steel.

At a recent meeting of the West of Scotland Iron and Steel Institute, Edward F. Law discussed the effect on steel of its various constituents, harmful and beneficial, chiefly the former. We make the following extracts:

We are in the habit of regarding steel as a material composed of only two constituents. In the case of steels containing less than 0.8 per cent. of carbon, these constituents are, 1, iron containing small quantities of other bodies in solution, which is described as ferrite, and, 2, carbide of iron (or, more strictly speaking, a double carbide of iron and manganese) which occurs together with a portion of the ferrite in the form of pearlite. In steels containing more than 0.8 per cent. of carbon the constituents are pearlite (or sorbite) and carbide or iron, or cementite.

These, it is true, are the only constituents in an ideal steel, but ideal steel, like most ideal things, is seldom met with, and we are forced to consider the constituents which are ordinarily found in steel, whether we choose to regard them as impurities or not.

Manganese Sulphide.

The best known of these secondary constituents of steel is manganese sulphide. I need hardly remind you of the difficulties experienced in the early days of the Bessemer process due to the presence of sulphide of iron and the method of overcoming these difficulties by the addition of ferromanganese, by means of which the iron sulphide is decomposed with the formation of manganese sulphide. So great was the improvement in the steel that manganese sulphide as a constituent of steel was regarded until recently as quite harmless. But this view requires modification, and it has recently been shown that it may, under certain circumstances, exert a very prejudicial influence. It would be more correct to regard it as a necessary evil which, if it cannot be eliminated, should at least be rigidly suppressed.

Manganese sulphide in the pure state has a specific gravity of 3.96, melts at 1162 degrees C., and passes through a plastic stage below this temperature. The MnS occurring in steel, however, is not pure, and probably melts at a considerably lower temperature. Hence, during the rolling of the steel the MnS is elongated and gives rise to a line of weakness. It is evident that in steel rolled into plates and sheets the MnS will also be rolled into sheets and will play much the same part in the steel as plates of mica in certain rocks. It is evident in this form that MnS is most dangerous, and a flaw which would be of little account in a round or square section becomes a serious matter in a plate or sheet.

Prof. Henry Fay, Boston, has made an examination of rails broken in service in the United States, and has come to the conclusion that a large number of fractures are due to sulphide flaws. All structural steels suffer more or less from the same defect, and even high grade steels are not always free from it. It may also be mentioned that MnS is the cause of a certain type of pitting and corrosion of boiler plates. Under the microscope MnS appears as a pale gray constituent, elongated by rolling and seldom broken up unless the rolling has been carried out at a low temperature. It varies in color and composition and frequently accompanies, or is accompanied by, other irregularities in the steel.

Silicates and Oxides.

Other constituents of steel which are liable to cause trouble are silicates. Two of these are known to exist in steel, viz., manganese silicate and iron silicate. Manganese silicate is somewhat similar to MnS in appearance, and may be mistaken for it. It is darker in color, however, and as it usually occurs associated with MnS there should be no difficulty in distinguishing between them. Silicate of iron is very much darker and is always badly broken up by rolling.

The importance of silicates in steel may be judged by the statement of Captain Howorth, who has placed it on record that in heavy nickel steel gun forgings 35 per cent. of the test pieces from the breech end and 5 per cent. from the muzzle end showed silicate defects in the fracture. The chemical specification for these forgings allows 0.05 to 0.20 per cent. of Si., but the chemical analysis gives no indication of the amount of this silicon occurring as silicate. Assuming that the analysis of a sample is well within the specification and shows only 0.15 per cent. of Si., and that only one-fifth of this amount exists as silicate, it will nevertheless be sufficient to cause the rejection of the steel, as it has been frequently shown that 0.02 per cent. of silicate is dangerous, and only the worst steels show as much as 0.03 per cent. A good steel, on the other hand, only contains about 0.005 per cent. of silicate.

Another constituent of steel which has not received the attention it deserves is oxide of iron. In the first place, it may be remarked that it is the only form of impurity which is unaffected by rolling. Not the slightest clue to the direction of rolling can be gathered from its appearance. This characteristic alone marks it out from the other types of slag. Moreover, it does not occur in large masses like the other impurities, but in very minute and spherical particles disseminated throughout the steel. Occasionally a number of these particles collect together and are then more readily seen. On account of their small size a very perfect polish is required and a high degree of magnification in order to detect them. It is almost impossible to detect oxide in a specimen etched in the ordinary way, but if etching is effected with strong acid (hydrochloric or sulphuric) and for a considerable time, the presence of oxide will be indicated by a marked porosity of the steel. This property of assisting the corrosion of steel is one of the principal characteristics of oxide. A bad steel may contain as much as 0.05 per cent. of oxygen, while a good steel should be practically free from this element.

The determination of these constituents (with the exception of S) by chemical methods is a laborious task, and from a casual consideration of the figures obtained, it might at first sight be supposed that the amounts present in steel were too small to exert any appreciable influence on its mechanical properties. But a more careful examination of the figures will show that this is not the case, for it must not be forgotten that they represent, in two cases at least, only one element of the constituent whose influence we are considering. Thus, for example, 0.05 per cent. of S means 0.13 per cent. of MnS by weight, or 0.23 per cent. by volume. That is to say, in every cubic foot of the steel there is almost exactly 4 cu. in. of MnS, and when we remember what 4 cu. in. may represent when rolled into thin sheets distributed in the steel, it is obvious that it must exert a very material influence. Similarly, 0.02 per cent. of silicate will mean at least ¾ cu. in. per cubic foot (and in this case *not* evenly distributed in the steel) and 0.03 per cent. of oxygen will probably mean another 2½ cu. in.

It is volume and not weight that we must consider, and this fact is brought forcibly to our notice by the microscopical examination of steel. For the last five years I have made a practice of carefully examining every sample of defective steel that has come under my notice, and I have been forced to the conclusion that this question is not merely a matter of theoretical interest but of vital and practical importance. It is gratifying to note that within the last year or two much attention has been given to this subject in the United States.

The Removal of Impurities.

Perhaps I may make one or two suggestions as to the cause and cure of impurities in steel. With recent improvements in rolling mill practice the mills are constantly "asking for more," and in order to maintain the efficiency of the rolls the furnaces are worked at their maximum output. As soon as the reactions are completed the metal is teemed, and the entangled slag never gets a chance of rising to the surface. This, more especially in the Bessemer process where slag and steel are thoroughly mixed, seems to be the chief cause of the trouble. As regards cure, the obvious remedy would appear to be to allow sufficient time for the slag to rise to the surface of the metal. At a meeting of the American Institute of Mining Engineers at which this subject came under dis-

cussion, Professor Howe, referring to a remark of Dr. P. H. Dudley, said: "I think that Dr. Dudley has put his hand on the thing which we have hitherto overlooked —namely, the opportunity for the oxide and slags to be removed from steel. I think the late experiences with electric furnaces show that he is right, if you consider what the electric furnace does. Of course, the electricity as electricity has nothing to do with it, but what it does is to allow the metal to stay stationary for a long while." He then adds: "It seems to me the great improvement is due to the ample time for the gradual removal of the inclosed slag."

It is hardly necessary to point out that the allowance of sufficient time for the separation of slag presents practical difficulties, but there is a way in which this may be accomplished and steel rendered almost entirely free from slag. I refer to the use of deoxidizers, and more especially silicon. The action of silicon may be regarded as fourfold, and in each case a beneficial influence is exerted on the finished steel. First, the silicon unites with oxygen and renders the steel entirely free from oxide; second, the elimination of oxide is accompanied by a marked increase in the fluidity of the steel, thus assisting the separation of slag; third, the combination of silicon with oxygen takes place with an evolution of a considerable amount of heat, which tends to maintain the steel at a high temperature, so that a longer time may be allowed for the separation of slag; and last, a small excess of silicon alloying with the steel has for many purposes a beneficial action, as it hardens and toughens it without causing any increase in brittleness. The usefulness of silicon in the case of rail steel has been amply proved by C. P. Sandberg. Not only have silicon rails shown in actual practice a life frequently double that of an ordinary rail, but they also possess an increased resistance to corrosion, due to the absence of oxide and slag.

The Flaming Arc Lamp in Iron and Steel Works.

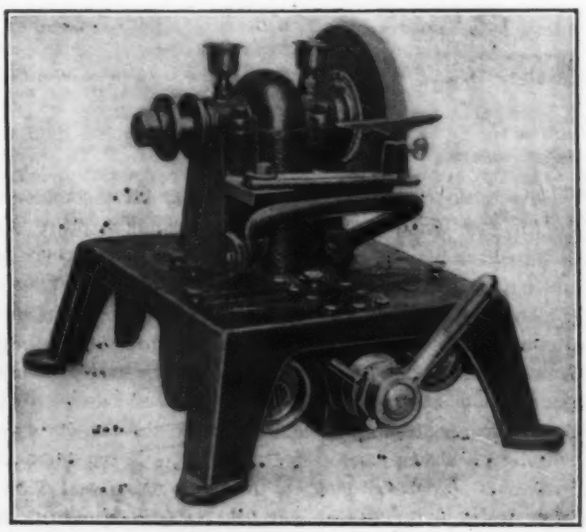
Up to a few years ago the flaming arc lamp was strictly a foreign product, much complicated in its construction and not at all adapted for commercial use in this country. This drawback was responsible for so few of them being used. Thoroughly trained and competent American experts took hold of the proposition, however, and with carefully conducted tests and intelligent development along lines of simplicity and efficiency they have produced a yellow flaming arc lamp that for brilliancy, power, high efficiency and economy of operation probably stands without a peer in artificial lighting.

The color, being the least absorbed by fog and smoke, has many points of advantage, and particularly adapts itself for use in steel mills, iron foundries and other large inclosures such as machine shops where it is necessary to hang the lamp a considerable distance from the floor in order to clear traveling cranes and moving machinery. The annoying feature of having the floor and platform almost totally obscured by smoke and dust from the furnaces, due to the inefficiency of the penetrating qualities of the old style lighting methods, has been effectually overcome by the use of the flaming arc light.

An excellent demonstration of the efficiency of these lamps is furnished in the plant of the American Wire & Steel Company at Worcester, Mass., which recently had the Western Electric Company install 16 of the Victor flaming arc lamps. The officials express themselves as being more than pleased with the results. The brilliancy of the steady yellow flame illuminates the entire plant with a flood of light never before equaled. These lamps have a frame of the parallel rod type. The cases are of steel, Japan finish, and are of substantial construction. They are easily removed, and when taken off give complete access to all parts without taking the lamp down. These lamps can be provided with an automatic attachment that will permit one or more of them to be cut out without interfering with the operation of the other lamps in the circuit. They are equipped with a paraboloid globe, which is a new departure in lamps of this type. The diffusion of light is perfect, giving a large uniform area of illumination.

The Helwig Portable Pneumatic Grinder.

A portable pneumatic grinder which is convenient and handy for grinding tools and other light grinding is a new product of the Helwig Mfg. Company, St. Paul, Minn. Where a stationary grinder is distant from the work or the work cannot be easily moved it is especially useful. Its construction is simple and it requires very little space. The motor is placed under the stand or base, out of the way, and is inclosed, thus protecting it from injury. The arbor casing above the stand receives the arbor, which



A Portable Air Motor Driven Grinder Made by the Helwig Mfg. Company, St. Paul, Minn.

runs in babbitt boxes in a divided bearing casing, permitting adjustment for wear.

These grinders are made in two sizes; No. 1 weighs 130 lb., requires 18 x 20 in. floor space, and is equipped with either one or two 1¼ or 1½ x 8 or 10 in. carborundum or emery wheels; No. 2 weighs 50 lb., requires 12 x 15 in. floor space, and is equipped with either one or two ¾ x 6 in. carborundum or emery wheels. Being small and compact and provided with a handle, this machine can be carried by one man to any desired location and placed conveniently near the operator, either on the floor (the base having two legs), or, as it is equipped with a clamping device, can be fastened to an I-beam or angle iron, or other support.

Engineering Meeting on Conservation of Natural Resources.

The American Society of Mechanical Engineers, American Institute of Mining Engineers, American Society of Civil Engineers and American Institute of Electrical Engineers will hold a joint meeting on the evening of March 24, in the Engineering Societies Building, 29 West Thirty-ninth street, New York City, on the general subject of the conservation of natural resources, to which all engineers and the public are invited. The following addresses will be made by representatives of the four societies: "The Waste of Our Natural Resources by Fire," by Charles Whiting Baker, member American Society of Mechanical Engineers; "The Conservation of Natural Resources by Legislation," by Dr. Rossiter W. Raymond, secretary American Institute of Mining Engineers; "The Conservation of Water," by John R. Freeman, for the American Society of Civil Engineers, and "Electricity in the Conservation of Energy," by Lewis B. Stillwell, member American Institute of Electrical Engineers.

THE IRON AGE

Established in 1855.

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Costs Must Come Down.

To those who once looked forward with confidence to the day when the United States would capture the lion's share of the iron markets of the world, there is much that is disheartening in the array of cost figures which steel makers have placed before the Ways and Means Committee during the past few months. If the iron and steel producers of this country cannot make pig iron and rolling mill products at lower figures, then they have no standing as competitors in the world's markets on their own merits, and may be justly regarded as interlopers by rival makers in other countries. However useful as a measure for gaining a foothold, or as an expedient for keeping down overhead costs a policy of dumping surplus into neutral markets may be, it cannot and will not, in the long run, justify an export trade of any magnitude. That must be based, ultimately, upon the firm foundation of low cost.

Let us examine broadly the factors which determine the position of our iron industry in that regard. It has been our boast that this country is unrivaled in its natural resources; that our energy and enterprise have helped us to overcome the drawbacks of distance in assembling, and that the scale of our operations, made possible by a huge home market, has given us striking advantages. We once were proud of the efficiency of our labor, and were pathfinders as inventors and engineers.

The agitation in favor of the conservation of our natural resources, admirable in itself, has created the impression that we have ruthlessly skimmed the cream of our iron ore deposits, have wasted the best of our coal and are, therefore, permanently on a much higher level of cost. It is useless to deny that there is some truth in these contentions. It is certain that we shall never be able to duplicate the lowest costs which were attained at one time on some of the Lake Superior ranges and in the South. It is true, too, that the grade of the ore is not what it once was. But we are still in possession of great riches, and we still can mine cheaply high grade ores and almost ideal fuel. But it is quite clear that we cannot put an arbitrarily high figure on the mineral in the ground, introduce that valuation into cost sheets as a fixed figure, and expect to meet competition in the world's markets on an even basis. It is only on that ground that some of the statements of cost of iron and steel recently published may be open to some criticism, since apparently the majority of them are based on the selling prices of iron ore and of fuel, which include more than liberal amounts for royalties and profits in transportation. In other words, the raw materials will not carry such fixed charges and permit the manufacturer who converts them to compete in distant markets with rivals not thus handicapped.

We have been far ahead of others in providing the means of cheaply assembling the raw materials. But we are no longer alone in the use of loading and unloading apparatus, or in handling heavy freights over long distances at extremely low figures. Our special mills designed to turn out enormous tonnages have been duplicated abroad, and will multiply in numbers there, as the interests consolidate and the markets enlarge.

It is somewhat more difficult to judge how we stand, relatively, as to the efficiency of our labor, because we are passing through a period of keying it up to something like its former standard, and because there is involved in the broader question of labor and its rewards the whole problem of getting back, as a nation, to a more reasonable and safer basis of living. But costs must come down because our natural advantages and riches will not permit us to be as liberal and extravagant either in returns to capital or in rewards to labor as we have been. If they are not forced down, we cannot expect to hold our own as sellers of manufactured goods, against others, in the world's markets. No ingenuity and energy of salesmanship, no paternal government measures can be more than palliatives in the face of the fundamental fact that our cost must be low, quality being equal.

The Standard Oil Rebate Case.

There has been much discussion the past week, by Government officials and others, to the effect that the decision in the Standard Oil case at Chicago has broken down the Interstate Commerce law, and that the Government will be unable in the future to obtain convictions on charges of rebating. These statements, however, appear to be merely the opinions of those who have been disappointed at the outcome of this particular case, and it may not be wise for any shipper to act upon the supposition that the law has been materially weakened. The facts in this case were peculiar and without precedent in proceedings before American courts. The prosecution failed because a Federal judge ruled that the alleged legal rate upon which it was based had never existed, either legally or in practice. In other prosecutions where there is no difficulty in proving a legal rate this question will not arise.

It would seem, however, that the final decision in this case, and the rulings of the Circuit Court of Appeals which the trial court followed, will throw considerable light on dark places in the law. The Government, in prosecuting any shipper, must furnish complete and clear proof of the legality of the rate on which the prosecution is based, and it must also show that the shipper knew he was not paying the legal rate and intended to violate the law. Until the Court of Appeals reviewed this case, it was generally believed that a shipper violated the law whether he knew it or not. He was presumed to know the legal rate, and required to pay it to the uttermost farthing, no more and no less. Under this theory of the law, which was promulgated by the Interstate Commerce Commission, the shipper who merely paid the rates demanded of him might continually violate the law without knowing it, through mistakes of the railroad, and many large corporations, in the effort to protect themselves, went to the length of making a critical examination of every tariff they used to determine whether the railroads had fully

complied with the law in issuing and filing it. The shipper who used this extreme care was often confronted by the necessity of violating the law anyway. He had to do business, and the legal defects that he found in the tariffs were beyond his control and could not be corrected by the railroad in less than 30 days. The courts have disposed of this mistaken theory of the law, and have made it clear that the shipper who acts in good faith in the ordinary course of his business by using tariffs which he believes to be legal, without any intent to violate or defeat the law, need not fear prosecution.

Indirectly, a larger question of paramount interest to all American corporations has been decided in this case. A theory of law has been growing in popularity for many years that a corporation is not entitled to the same rights in court as a natural living man. Proof "beyond a reasonable doubt" must be presented to a jury to convict the living man of any crime, this rule being one of the fundamental principles of Anglo-Saxon law. Juries in civil cases have long been disposed to require less proof against a corporation than if the defendant was a living man, and the new idea in rebate cases of prosecuting the corporation as a criminal has brought with it the possibility that the corporation might be convicted on flimsy and "framed up" evidence of a character that would appeal to a jury. It rests with the courts to protect the corporation against convictions of this character. It would be a curious development of law in the United States for the living man to enjoy all the rights and immunities afforded him by the common law, while the corporation would be judged under the ancient theory of the Roman law, which in practice required the defendant to prove himself innocent. The United States Supreme Court has already denied to the corporation the right of immunity, or of refusal to give evidence against itself, and it is only a step farther to deny a corporation accused of crime the right of proof "beyond a reasonable doubt." That step was actually taken, in practical effect if not in form, in the first trial of the Standard Oil Company in Chicago, and resulted in a conviction by the jury on 1400 odd counts in one trial, followed by a fine of $29,240,000. The property of any great corporation might be confiscated by the Government, if the rulings on the admissibility of evidence which were followed in that trial were generally adopted by the courts. What the Court of Appeals really reversed was this theory of law as applied in the prosecution of a corporation.

Cost Allowance for Developing Products.

A common saying among manufacturers is that few concerns figure their overhead expense high enough. There appears to an almost unconscious tendency to minimize the aggregate of those costs which figure neither as productive labor nor as materials. Expenses of which there is small realization creep into a business, and there are prospective costs which are overlooked and consequently not provided for. Allied with the item of overhead are those elements which must be taken into account in determining the amount of profit that shall be added to the cost and paid by the customer, for allowance must be made for such considerations as surplus and growth, the latter including the development of the product. This question is convincingly discussed in a communication from a machine tool builder, in which he says:

> The selling price of a machine is made up of the money paid out for material, labor and overhead burden, or expenses of operating the factory, which includes, of course, such items as depreciation and repairs, and further must take in the expenses of selling the goods, also the profit it is desired to make on the basis of the year's business. Now this covers simply an ordinary business running along without change in the kind of goods made or any increase in the lines manufactured.
>
> Suppose, however, that a person was ambitious and wanted to increase his equipment and his lines of manufacture and desired to avoid increasing the capital stock of the company. In that case, in addition to the amount of money he should receive for each hour of any workman's time, he must secure a little additional money so that he can put in a new machine once in a while when he finds the old one getting worn out, or when he finds that in some department the work is going relatively slow and the new machine must be added in order to make the same rate of progress through that department that is made elsewhere. He also wants a little additional money to pay for the design of the new machine and the necessary detail drawings which go with this. There are the patterns to be made which require the investment of considerable money; then when the manufacturing of the first machine is started, there are the castings and other raw material to be paid for and the labor in the machine shop; catalogues to be made up and printed, more or less advertising to be done, and traveling and other expenses to be considered. Then the accounts are to be carried for a longer time than usual, because the machines are new and probably sent out subject to trial.
>
> All of the money necessary to cover these items must be secured, as above stated, either by increase of the capital stock, or if this is to be avoided, by an increase in the amount of money secured for each man's labor in the shop above what the actual labor and overhead expenses would ordinarily require. For that reason, a concern which is to be progressive and prosperous must secure for each hour's pay for a workman's labor a certain percentage to fulfill the conditions as outlined.

Here is food for thought that can be digested and absorbed by not a few manufacturers to their material benefit. Too many of them cherish the delusion that their cost systems are complete, when in reality there is room for profitable correction. Essential elements of expense are not realized, among them those referred to by the writer of the communication from which we have quoted. The initial cost of new products before a dollar of return can be hoped for is almost invariably large and frequently formidable in its ratio to the business transacted by the manufacturer. Rarely, if ever, does the first machine of a new type or patttern come up to the standard striven for, and consequently it may not leave the home works. Sometimes several machines are discarded, one after the other, before the desired perfection of model is achieved. Meanwhile the labor bill has been piling up, with its share of the overhead expense. The machine shop and foundry have been called upon for many hours of work at machine and bench and on the molding floor. Drafting room and pattern shop are heavy burdens in new work, but these expenses usually figure directly into the overhead. The factor of material is by no means to be slighted.

It is apparent enough that the item of progress must figure as an essential factor all through the cost system in providing the necessary funds with which to meet its demands, unless the intention is to introduce new capital into the business. This apportionment of costs may be done in various ways, and it matters little how, so long as the management provides for it. Too many shops have hardly any definite comprehension of the magnitude of this expense. The better they understand it the more prosperous they should be eventually, and the less their liability to deception as to the average profits of a period of years.

Jogs in the Curve of Lake Ore Shipments.

The all-rail shipments of Lake Superior ores in 1908, estimated in connection with our statistics of water shipments published December 10, 1908, at 500,000 gross tons, prove to have been 588,000 tons, so that the total shipments from Lake Superior mines last year were 26,014,987 tons. This represents a falling off of 38.4 per cent.

from the 1907 shipments, which were 42,245,070 tons. As 1909 shipments of lake ores promise to be below the average shipments of the preceding four years it will be interesting to note from the records how relatively few have been the instances of decline in lake ore shipments, not only from those of the preceding year but from those of any previous year. The statement below presents the grouping of the Lake Superior ore statistics by periods of 20, 10 and 5 years, recently employed by one of the iron ore selling firms to represent graphically the signal growth of the industry:

Year.	Gross tons.	
1888	5,063,877	
1889	7,292,643	
1890	9,003,725	
1891	7,071,053	Decrease from 1890 = 21.46 per cent.
1892	9,070,554	
1893	6,067,403	Decrease from 1892 = 33.11 per cent.
1894	7,748,312	
1895	10,429,037	
1896	9,934,828	Decrease from 1895 = 4.7 per cent.
1897	12,464,574	
1898	14,024,673	
1899	18,251,804	
1900	19,059,393	
1901	20,593,537	
1902	27,562,566	
1903	24,289,878	Decrease from 1902 = 11.87 per cent.
1904	21,822,839	Decrease from 1902 = 20.82 per cent
1905	34,353,456	
1906	38,522,239	
1907	42,245,070	
1908	26,015,000	Decrease from 1907 = 38.4 per cent.
Total	370,886,461	
1907 shipments	42,245,070	
1888 shipments	5,063,877	

20 years' increase..37,181,193 = 1,859,060 tons per year average increase in 20 years, or an average increase of 36.71 per cent. per year for 20 years, or a total increase in shipments of 1907 over 1888 of 734.25 per cent.

1907 shipments	42,245,070
1898 shipments	14,024,673

10 years' increase..28,220,397 = 2,822,040 tons per year average increase in 10 years, or an average increase of 20.12 per cent. per year for 10 years, or a total increase in shipments of 1907 over 1898 of 201.22 per cent.

1907 shipments	42,245,070
1903 shipments	24,289,878

5 years' increase...17,955,192 = 3,591,038 tons per year average increase last five years, or an average increase of 14.78 per cent. per year for five years, or a total increase in shipments of 1907 over 1903 of 73.92 per cent.

It will be seen that of the 21 years covered by the above figures in only six did the shipments fail to reach those of the year preceding. And in only two cases of falling off has the year following the year of decline failed to make a new record. One of these instances was in 1894, when, though an increase was made upon the low year 1893, the records of 1890 and 1892 were not equaled. Another case was in 1904, when there was not only a decline from the preceding year of decline, but also from the record of 1902. We may assume that 1909 will prove to be a year like 1894 in that while it will exceed its predecessor, it will not reach the high record, which is now that of 1907, and may not equal that of 1906.

The records of increases in the 20, 10 and 5 year periods will bear examination and are suggestive of the future lake ore movement, as well as the course of pig iron production, since the two are fairly parallel. It will be seen that while the percentage of total increase and percentage of increase per year diminishes as the shorter periods of comparison are taken, the tonnage increase shows marked growth. Thus, while the increase from 1888 to 1907 was 1,859,060 tons a year, it was 3,591,038 tons a year for the five years ending with 1907, or nearly twice as much. As we come into the years following 1900 we deal with large figures yet the percentages must diminish.

What is most suggestive about the table is that unless all the precedents of the 21 years are to be broken, 1910 will carry the record well beyond the 42,000,000 tons of 1907, which would mean, in turn, a distinct advance beyond 25,781,000 tons of pig iron. Such prospects are pleasant to contemplate from such an environment as that of to-day.

CORRESPONDENCE.

The Isolated Power Plant.

To the Editor: The suggestion made in the article in *The Iron Age* of February 18 by Richard W. Hale that the consulting engineer will favor an isolated plant because his commission may be affected by it is not well founded. It might as well be said that lawyers would advocate litigation to increase their charges, and that doctors would keep their patients sick to prolong their visits and increase their fees. While some lawyers and physicians may do so, such practices are not general, and as a client must trust somebody in matters with which he is not familiar, the only person he can properly trust is the one he pays for advice. Any consulting engineer who, to increase his commission will advocate installing an isolated plant, regardless of the conditions, is not worthy to be employed. On the contrary, it is extremely probable that he will give the central station the benefit of every doubt to be perfectly sure that he is acting fairly. The operating engineer is in a different position; his livelihood and position are at stake. Hence, he is likely to be biased in favor of an isolated plant. As far as the consulting engineer is concerned, the additional equipment required for an isolated plant over what would be required anyhow for heating, plumbing, refrigerating, sanitation, wiring, piping, &c., increases his fee relatively little. Moreover, this slight increase in fee is not at all in proportion to the extra time and work demanded of him in its design and installation.

The best way to judge whether an isolated plant is advisable or not is by careful investigation of previous experience. Averages are always deceptive. The comparison should be based on the most approved modern practice, and the plant designed of no greater size than necessary to provide for immediate needs and for future needs that may be foreseen. The apparatus should be designed for the most economical operation possible, having in view all the time that the cost of operation includes fixed charges. Accurate data are available on operating costs, both with and without isolated plant. The writer has been collecting them for the last 10 years, and has published many detailed statements of operating costs of plants, similar to the one which follows later. By a straight comparison between the two costs a very definite idea can be obtained as to the relative value of service from the isolated plant and from the central station.

Before giving these figures it seems advisable to take up the separate items mentioned in Mr. Hale's article for

GENERAL DISCUSSION.

Rent.—In general, nothing should be allowed for the rental value of space occupied by the plant. In nine out of ten cases, where a plant has been installed and where service from the street had been used previously, no additional space was rented, the plant being installed in the space originally left for machinery. In special instances it is proper to allow for the value of rent, as in some large department stores or office buildings, where space has to be sacrificed and which would be used for other purposes had the plant not been installed. However, the electric plant proper occupies but a small portion of the total space occupied by the machinery, which includes elevator pumps, house, fire and boiler feed pumps, vacuum cleaners, refrigerating machinery, steam heating devices, &c.

Interest.—The allowance of 5 per cent. is correct, but if the investment is to be written off year by year at a certain stated rate, the amount of interest should also decrease.

Depreciation.—This is, more properly, a refunding charge. The situation in an isolated plant is entirely different from that in a central station. In the latter the load develops from year to year very rapidly; because of the high value of real estate and the continual improvement in electrical machinery, it is necessary to figure on the plant becoming more or less obsolete in 15 years. On the other hand, the isolated plant is located in a building of determined size, with demands that will not vary in 10 or 15 years materially. Additional uses may develop for steam and electricity, but the heating, water supply, elevator operation and lighting remain substantially the same and constitute the bulk of the load. Steam piping, covering, electric wiring, foundations, auxiliary apparatus, such as feed water heaters, feed pumps, are all standard, and they depreciate but little more than the building itself. It is usual to allow a maximum of 2½ per cent. for building depreciation, but 1½ per cent. is more nearly the average amount allowed. It has been my practice to allow 5 per cent., to be on the safe side, on the whole cost chargeable to the electric plant; but from a strictly auditing standpoint a charge of 5 per cent. on the moving machinery and 2½ per cent. on the piping, connections, foundations, &c., which would not wear out, would be an ample allowance.

Repairs and Renewals.—The only serious repairs and renewals likely in a well designed electric isolated plant are as follows: The engine cylinder may need reboring after five or ten years, depending upon the amount of use, character of the oil, &c., and the valves, rods and brasses may need renewing. On the dynamo the commutator will probably have to be renewed in from eight to twelve years. In addition to this, there are repairs made necessary by accidents and neglect. I think that 5 per cent. of the cost of the engines and dynamos is not excessive for repairs, if this cost is figured over a period of 20 years; but if this amount is expended year by year in repairs the plant should be in as good condition at the end of this time as it was when new, with this amount expended, the engines and dynamos could be rebuilt twice, in so far as the wearing parts are concerned. It is my practice to allow 3 per cent. on the total cost of the installation required for the isolated plant for repairs and for renewals, with the exception of storage battery installation, where I allow 6 per cent. on the cost of the battery.

Taxes.—This is a practical question. Taxes are based on assessed valuation, and that has rarely if ever any relation to the character of the contents of the building. I know of no case where taxes have been increased because of the installation of an isolated plant.

Insurance.—The isolated plant must be insured as well as any other machinery or apparatus in the building, and the rate should be figured for each separate case. In a fireproof building the rate of insurance will be as low as 14 cents per $100. The insurance is rarely increased because of the installation of an isolated plant. The building is usually insured for 80 per cent. of its value, and unless the plant is a large proportion of the total cost of the building, the 80 per cent. valuation amounts to about the same whether a plant is installed or not. That is, the electric plant proper for a building costing $400,000 would not amount to much over 3 per cent. of the total cost, and I doubt if any owner of a building would increase his insurance to provide for the increased investment made by installing an isolated plant. In manufacturing establishments where the power plant may be a large proportion of the cost, the cost of insurance should be included.

Water.—The cost of water for plant purposes would depend upon how much of the exhaust steam is condensed. A ton of coal will ordinarily evaporate 250 cu. ft. of water, which would cost 25 cents at $1 per 1000. In the heating season probably nine-tenths of this amount will be returned to the boilers, making the cost of water per ton of coal about 2½ cents. In the summer season, allowing for the quantity returned to the feed water, the cost may be 20 cents per ton. As the greatest load comes on in the winter season when the exhaust is condensed, it is probable that 10 cents per ton is about the correct average charge for water used in the boilers.

Sundries and Labor.—Mr. Hale's discussion of sundries and labor seems to be fair. It is quite true that the labor cost in an isolated plant is likely to be an increment cost. In nine cases out of ten it becomes necessary merely to add a low price man on a shift, but in many cases it is not necessary to add anybody, although it is usually necessary to increase the pay. The change in labor cost should be carefully estimated for each case.

Profit.—It would certainly not seem advisable to install an isolated plant unless there was some profit to the purchaser, either in money or otherwise, over and above the interest he would obtain on his money, and a fair allowance for renewals. If there is no other profit than a pecuniary profit to be derived, I should say that the purchaser should figure on at least 10 per cent. It is my practice not to advise the installation of a plant, other things being equal, unless there is a total profit, including interest and depreciation charges, of at least 25 per cent. on the cost of its installation. In many instances, however, there are other profits—i. e., profits derived from having a skilled force of mechanics on the premises to take care of repairs to other machinery; being able to use electricity freely without greatly increased cost; continuous operation without danger of breakdown—this applies more particularly to buildings supplied in out of town districts, as in the large cities the central stations are fairly free from such troubles, and these facts may make a private plant advisable even if it costs as much to operate as central service.

As to Mr. Hale's conclusion, the operation of the isolated plant is no more of a small business in itself than is the operation of an elevator system, refrigerating system or a heating system. If all the factors in the operation of a building are confined in one central isolated plant, the operation is at least as simple as is the operation of a building where an engine and fireman and other assistants are employed to take care of the heating system, the elevators and the refrigerating system, while electricity is purchased from outside, and a separate arrangement and separate provision has to be made for keeping track of electric bills, for ordering of electric lamps and for testing of meters.

COMPARATIVE DATA.

These are the general considerations, and as an example of complete figures of operating cost and as showing the method of comparison to be adopted, it seems advisable to publish figures received from the Security Mutual Life Insurance Company Building at Binghamton, N. Y., and compare them with figures of operating cost of a model building recently built in New York City, where the number of kilowatt hours delivered, type of elevators and the general service is very similar. These figures are absolutely correct, and the enormous difference shown between the isolated plant operation and the central service supply can be duplicated in dozens of instances. The total cost of operation for the year 1908 was:

Fuel	$4,189.00
Labor	3,191.00
Ash removal and sundries	308.28
Oil, grease, &c.	126.90
Incandescent lamps	192.00
Total	$8,006.18

The original cost of the plant, including the additional cost of steam fitting and wiring, was less than $15,000. Allowing 5 per cent. for interest and 5 per cent. for depreciation or refunding, nothing for rent, nothing for taxes and nothing for insurance as none of these items were increased by the installation of the plant, nor would they be decreased by the shutting down of the plant, the total cost of operation, including fixed charges, may be estimated at $9500 a year.

In the model building referred to, containing plunger elevators the same as those in the Security Mutual, and using about the same quantity of electricity, the cost of electricity alone was over $12,000 last year at rates of 5 and 4½ cents per kilowatt hour, and, in addition to this, the cost of running the steam plant for operating the plunger elevators, for heating and for running the small pump, was greater than the total cost of operating the Security Mutual Life Insurance Company's plant. The total cost of operating this model building was over $23,000—*i. e.*, for heat, light and power, as compared with $9500, including fixed charges for the Security Mutual plant.

A similar comparison could be made between the building at Forty-first street and Park avenue, known as the Terminal Building, and the building at Thirty-fifth street and Fifth avenue, in which Maillard has his restaurant. The Forty-first street building has its own plant; the Maillard building has not. Maillard's operate a small refrigerating plant, otherwise steam is only used for heating and cooking. The cost of operating the Thirty-fifth street building is greater than the cost of operating the Forty-first street building by something more than the total cost of the electricity, which last month amounted to over $1100. Or, to put it another way, the cost of the electricity in the Thirty-fifth street building alone was equal to the total cost of operating the steam, electric and heating plant of the Forty-first street building, plus the cost of running the heating plant and the refrigerating plant of the Thirty-fifth street building. The amount of electricity used at the Forty-first street building, it is true, is less than that used at the Thirty-fifth street building, because of the restaurant on the first floor, but it is perfectly safe to say that the whole heat, light and power equipment at the Thirty-fifth street building could have been operated for less than three-quarters of the electric light bill alone.

The building of S. Langsdorf & Co., at the corner of Spring and Crosby streets, a building 100 x 100 ft., 12 stories, containing a private plant, shows an average cost for operating the heat, light and power installation of less than $450 a month; while the lowest estimate received for electricity alone was over $7000 a year.

These are the facts, and no amount of theorizing as to depreciation charges and as to benefits derived from large quantities can possibly counteract their effect.

SIGNIFICANCE OF GAS POWER.

There is another feature entering into the design of isolated plants which is just beginning to receive its proper recognition, to wit, the development of the gas producer. Heretofore an isolated plant has only been advisable when the total cost of current used ran up above $3000 a year; but with the introduction of the gas producer plant, with its ease of operation, simplicity and low cost of power production, the field for isolated plants has been very much widened. With a gas producer and gas engine almost any factory plant can profitably compete with central station service, and as a kilowatt hour can be generated from 2 lb. of coal, the labor factor becomes almost insignificant because of the small quantity of coal to be fired and because of the comparative simplicity of the apparatus. PERCIVAL ROBERT MOSES.

NEW YORK, March 1, 1909.

Power Plants—A Practical Analysis.

To the Editor: The papers of Messrs. Ripley and Hale on the relative merits of isolated plant *vs.* central station electric current supply* attract attention, more perhaps from the narrow and radical viewpoint which each has taken than from their broad value as a contribution to engineering literature. One might assume from the claims made by each party that his method was a panacea for all users of power.

* *The Iron Age*, January 7, 1909, and February 18, 1909, respectively.

The impression given to the layman in each case is misleading, as there are elements in each form of supply which combined would be of commercial and practical value, whereas, if applied absolutely independently would result in financial loss and worry to the prospective user. The owner's requirements should be analyzed by a competent and disinterested party to obtain the most economical source of supply for his particular case.

CONSIDERATIONS.

On general principles, the considerations entering into the selection of power generating apparatus may be divided into the five following classes: Continuity of operation, fire protection, safety and convenience, comfort of employees and total cost of power, steam for manufacturing and maintenance.

Continuity of Operation.—A source of power that is subject to breakdowns and delays is expensive, therefore, the engineer in his recommendations must consider many things, such as climatic conditions, equipment, arrangement of lines and management of a public service corporation; or, on the other hand, the location and means of obtaining proper help to supervise and operate an isolated plant. Where this most important feature is considered there are some cases where an owner could better afford to put in a portable boiler and a donkey engine than a high type of isolated plant or purchase power from a poorly equipped or managed public service corporation.

Fire Protection.—This resolves itself into a question of environment and the amount of property the owner has at risk; also he should determine whether his insurance shall be $14 per $1000 or 70 cents per $1000, as well as the capital available for the equipment of the plant with proper protective apparatus. This is a consequential expense which is sufficiently large in many cases to be taken into account in the design and layout of a power plant, and in the writer's experience it has oftentimes been the influencing factor.

Safety and Convenience.—This is again dependent on environment, such as the character of help, water for boilers and uses of steam for chemical and mechanical processes.

Comfort of Employees.—Too much attention cannot be given to the question of providing comfortable surroundings for employees. Heating, ventilating, exhausting of vapors, foul gases, &c., from the different rooms are matters which should be carefully balanced and considered, and are important factors.

Total Cost.—All of the preceding items enter into and form the different unit costs that make up the total of plant maintenance and operation. The most satisfactory plan to the owner is the one giving continuous power combined with the operation of the plant under the above conditions at the lowest possible cost.

CONCLUSIONS.

Conditions vary, and to assume or create the impression that the only solution is an isolated plant alone or the central station supply is erroneous and misleading. Basic facts may be sidetracked for the time being, and the owner, engineer or central station manager may fool himself for a certain time in the sophistry of self-interest, but truth will eventually prevail, and no one can afford to recommend apparatus with his opinion biased in financial self-interest, as intimated by Mr. Hale in the first part of his paper.

The engineer's chief aim should be to see his efforts economically successful, leaving a record which cannot be excelled, a reputation beyond reproach and a satisfied client. To attain it the problem should be approached in a fair and broad spirit, selecting the best from the entire engineering field and eliminating the expensive, uncertain and objectionable features and giving to his client an equipment which will, when in operation, give the highest efficiency at a minimum cost.

From the standpoint of self-interest (financially) this subject can be discussed from now until the end of time and the owner will be as much in the dark as when the discussion was started. It is a proposition which should receive proper and concise analysis, taking into account the elements which go to make up the best methods applicable to a specific case.

EXAMPLES.

The following cases have come directly under the writer's experience and supervision:

The economy of isolated plants where total costs of steam, power, heat, light and insurance had to be considered:

	Annual economy.	Total annual expense.
Case 1	$5,000	$25,000
Case 2	15,000	48,000
Case 3	30,000	125,000
Case 4	8,000	45,000

The economy of central station supply where the above elements do not enter into the expense:

	Annual economy.	Total annual expense.
Case 1	$6,000	$45,000
Case 2	1,500	12,000
Case 3	3,000	15,000

Greater savings than this have been made by the purchase of current from public service corporations where power alone has to be the only consideration.

As a general proposition, however, applying to industrial establishments where an approximate heat balance exists in the amount of steam required for power and steam for manufacturing purposes, heating, fire protection, &c., electric current should be sold from 8 mills to 1¼ cents per kilowatt hour for the owner to break even at the end of the year. Where the boiler plant is the predominant feature the above low price fails to attract the owner.

Where the waste products of a factory are used as fuel and it is necessary to burn it up, there is absolutely no chance for the central station supply as an economical proposition, provided the waste is sufficient to generate the proper amount of power.

FREDERICK A. WALDRON.

NEW YORK, March 6, 1909.

A Fixed Profit Considered the Desideratum.

To the Editor: As you show in your interesting editorial of March 4, the pendulum has swung to the extreme of low to high prices in the past 12 years. At one extreme prices were so low that no margin of profit remained, either to capital or labor, and all purchasing power was lost and business was not possible. At the other extreme prices were so high that there was no margin of profit to the buyer and there was no business. Cost of living left no profit to the average man, and cost of construction, &c., was too great to insure a profit on operation or to furnish a margin sufficient upon which financing could be done.

Is it not axiomatic that a margin of profit is the essence of business? The purchasing power of the masses is in this to create business, and the basis of investment is the margin to carry it on. Should it not then be the law of business to maintain the margin of profit? We hear continually of the necessity of agreements, combinations, &c., to maintain a fixed price for metals, coal and freight rates, but older lines of business are carried on—agriculture, dry goods, groceries, the general retail trade, indeed, most of the business of the world—without feeling this necessity. Why is this? Is it not because the idea of a fixed profit is believed generally to be the first necessity, and that without this business cannot continue? Are the cutting of price below cost at one time and then again the effort to maintain a fixed high price peculiar to this day of great combinations—the cutting preliminary to combination and the high fixed price a necessity of combination?

There is nothing analogous to such a fixed condition in nature. Costs of production fluctuate; productiveness of soil and maybe the energies of men vary from time to time. The adjustment of price to costs and costs to price seems the important function of the business man and neither stockholders, labor nor creditors can remain satisfied with a management that gives away the margin of profit or that refuses to do business unless at a fixed price in which there may be several profits. It is the plain duty of the business man to maintain the margin of profit and to shut down only when that profit is not obtainable. It is to the consumer's and the shipper's best interest that that margin of profit be obtained and maintained, otherwise the producer or carrier consumes his plant and resources and cannot reduce his costs by improving his facilities.

Were it possible to associate all in the idea of maintaining a margin of profit, all joining—capital, labor, shipper, carrier and consumer—in the slogan, "A fair profit for all," it would be a happier, better and more profitable world to live in. To sell below cost is a business sin and to charge too much an old-time folly.

Another thought: Is not the high cost of living proof that we are overspecializing on manufacturing lines? Would it not be better to go back to the soil and employ more men on the farms? If the profit is not in manufacturing let the surplus labor produce from the soil, the original source of wealth and purchasing power. Is not the artificial price basis holding men idle who would better dig instead of awaiting the result of the effort to maintain a fixed price? The Old World people must understand this. The foreign laborer promptly goes back to his country when demand for manufactured products halts.

Will you preach the doctrine—I would almost say the religion—of the fixed profit? Blessings would follow.

WALTER GRAHAM.

VILLA NOVA, PA., March 8, 1909.

The De Forest Sheet Steel Company.—The contract for erecting the structural steel buildings for the new plant of the De Forest Sheet Steel Company and the T. & T. Roofing Company, Niles, Ohio, has been awarded to the Riter-Conley Mfg. Company, Pittsburgh. The Morgan Engineering Company, Alliance, Ohio, was given the contract for the two cranes, one being of 35 tons capacity, with a 5-ton auxiliary, and the other a 15-ton crane. Other contracts have not yet been closed. Work on the new plant will start in a few days. It is expected that it will be ready for operation about October 1.

Metal Trades Meetings.

Cincinnati.

In some ways the most significant meeting in the history of the organization, the annual meeting of the Cincinnati Branch, National Metal Trades Association, March 11, was specially enjoyable because of the addresses at the banquet by men of national and trade importance. The large banquet room of the Business Men's Club was used for the occasion. Two of the announced speakers, W. A. Layman, Wagner Electric Mfg. Company, St. Louis, and H. P. Eels, Bucyrus Company, Milwaukee, were unavoidably absent.

The chief speakers of the evening were Congressman Herman P. Goebel, who in a carefully prepared paper set forth the disadvantages our Government suffers through its inefficient merchant marine and ocean mail service, and Alfred H. Post, New York, who prefaced his talk on "Co-operative Freight Traffic," facilitating consolidated carload shipments with a strong argument on the subsidy question. He contended that Congress should pass a subsidy bill that will provide and guarantee regular lines of fast mail steamers with comfortable and modern cabin accommodations from both the Atlantic and Pacific coasts. A chief thought in Mr. Post's preliminary talk was expressed in these words: "No subsidy will ever accomplish the results we desire unless it will provide for steamers which will carry our mails and bring to our shores as welcome and willing travelers the merchant and buyer of South America, Australasia and the Orient."

The annual report of Secretary John M. Manley was interestingly statistical in character. Calculating that the number of operatives on June 15, 1907, was 100 per cent., a study of the quarterly reports since that time disclosed a steady decrease in number of employees, aggregating 47 per cent. Reports received December 15, 1908, showed an increase over the previous quarter of 3 per cent.; total net decrease in number of operatives, 44 per cent. Reports thus far received for the present quarter show an increase by the firms reporting in number of operatives employed, over the preceding quarter, of 15 per cent. On industrial education the report showed that there are at present 125 young men in the co-operative course in engineering, working and studying alternately in the shops and at the University of Cincinnati. The prediction was ventured that within 10 years that number will be increased to at least 1000. A feeling reference was made to the deaths during the year of Carl F. Lunkenheimer of the Lunkenheimer Company and John Howard Day, president of the J. H. Day Company.

A particularly felicitous speech of the evening was that of Commissioner Robert Wuest of the National Metal Trades Association. He complimented the executive capacity displayed by member J. C. Hobart of the Cincinnati branch and predicted some national honors for that gentleman. He referred to the liability insurance problem as one requiring careful study, bespoke for the premium system a universal popularity when thoroughly understood and understandingly applied, and urged a big attendance at the coming meeting in New York (April 14 and 15) of the National Association. He eulogized the labor bureau feature of the local organizations and suggested that the Cincinnati bureau was not used as much as it should be. He referred also to B. B. Quillen, Cincinnati Planer Company, and that gentleman's chances for representation in the Administrative Council of the national body, which, if carried out at the meeting, would give Cincinnati the largest representation in that section of the great organization of tool builders of any city in the country.

President Lodge, Lodge & Shipley Machine Tool Company, told of the past presidents and gave some inside history of the Cincinnati branch.

J. C. Hobart gave an informal but highly interesting talk on "Membership." He recalled the meeting 10 years ago at the Gibson House, where the Cincinnati branch was organized, with eight men as its sponsors. "The great success of the Cincinnati branch," said he, "is in the future, as it has been in the past, in its adherence to high ideals."

To Benjamin Sebastian of the Sebastian Lathe Company was allotted the distinction of closing the speech making, displaying his ability as a quick witted after dinner talker.

John W. Neil, John H. McGowan Company, was re-elected president; B. B. Quillen, Cincinnati Planer Company, vice-president; Henry Ritter, Lunkenheimer Company, treasurer; L. G. Robinson, J. A. Fay & Egan Company, secretary. The new Executive Committee is made up of A. E. Robinson, American Tool Works Company; August H. Tuechter, Cincinnati-Bickford Tool Company, and E. H. Hargrave, Cincinnati Tool Company.

Chicago.

The Chicago Branch, National Metal Trades Association, held its annual meeting and dinner on the evening of March 9 at the Mid-Day Club, Chicago. Following the reports of officers, which showed the association in a most healthy condition, numerically and financially, a resolution was adopted electing John D. Hibbard, former president of the John Davis Company, to honorary membership. Mr. Hibbard had served the organization continuously for five years, two years as president and three years as a member of the Executive Committee. The election of officers resulted as follows:

President, John W. O'Leary, A. J. O'Leary & Son Company; vice-president, W. L. Kroeschell, Kroeschell Bros. Company; treasurer, L. C. Walker, Aermotor Company; secretary, Paul Blatchford, 1524 Tribune Building, Chicago. Executive Committee: John W. O'Leary, A. J. O'Leary & Son Company; W. L. Kroeschell, Kroeschell Bros. Company; L. C. Walker, Aermotor Company; F. C. Caldwell, H. W. Caldwell & Son Company; Francis S. North, Union Special Machine Company; Staunton B. Peck, Link-Belt Company; Louis E. Burr, Woods Motor Vehicle Company; A. T. Simonds, Simonds Mfg. Company; H. H. Latham, Latham Machinery Company.

The address of the evening was delivered by Prof. Charles Richmond Henderson of the University of Chicago on "Employees' Insurance." He held the undivided attention of his auditors, over 100 in number, for almost an hour. Rounds of applause and an enthusiastic vote of thanks testified to the value of the address. A committee of seven was appointed by the newly-elected president to co-operate with Professor Henderson in furthering a rational handling, by employers, of this subject. Director George N. Carman of the Lewis Institute spoke on the progress made in the practical development of the co-operation course in mechanic arts, in which the members of the Chicago branch and the Lewis Institute are jointly interested. Altogether, the meeting proved one of the most interesting and best attended and satisfactory in the history of the association.

Boston.

The Boston Branch, National Metal Trades Association, held its annual meeting and dinner at the Parker House, Boston, March 9. The officers elected were Edwin E. Bartlett, president; E. P. Robinson, Atlantic Works, vice-president; Duncan D. Russell, James Russell Boiler Works, treasurer; M. H. Barker, American Tool & Machine Company, and Fred F. Stockwell, Barbour-Stockwell Company, members of the Executive Committee until 1910, and Winslow Blanchard, Blanchard Machine Company, and H. I. Illingworth, Boston Machine Works, Lynn, until 1911. The president, vice-president and treasurer were re-elected. Messrs. Blanchard and Illingworth are new members of the board. The reports of the various officers were accepted.

Worcester.

The Worcester Branch, National Metal Trades Association, held its annual meeting and dinner at the State Mutual Restaurant, Worcester, Mass., March 9, with a large attendance from Worcester, Fitchburg and other places of the vicinity. John R. Back was elected president; George I. Alden, Norton Grinding Company, vice-president; Charles F. Marble, Curtis & Marble Machine Company, treasurer; and H. B. MacDonald, Simonds Mfg. Company, Fitchburg, Mass., and Channing M. Wells, American Optical Company, Southbridge, Mass., mem-

bers of the Executive Board. The terms as members of the board of Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Company; A. E. Newton, Prentice Bros. Company; George F. Brooks, Harrington & Richardson Arms Company, and Clarence W. Hobbs, Hobbs Mfg. Company, all of Worcester, do not expire this year. Vice-President Alden and Treasurer Marble succeed themselves.

Philadelphia.

Nearly 100 members and guests of the Metal Manufacturers' Association of Philadelphia participated at the fifth annual banquet of the association, which was held in the Bellevue-Stratford Hotel in that city, on the evening of March 11. Wm. S. Hallowell, president of the association, made the welcoming address and introduced the speakers of the evening. John M. Shrigley, president of the Williamson Trade School, spoke on "The New Apprenticeship"; Walter Drew, commissioner of the National Erectors' Association, made an address on "The Significance of the Case of the Bucks Stove & Range Company *vs.* The American Federation of Labor," while J. C. Monaghan, secretary of the National Society for the Promotion of Industrial Education, spoke on "Industrial Education." The addresses were all exceedingly interesting, and the function was the best the association has ever held. The officers of the association are as follows: President, William S. Hallowell, Harrison Safety Boiler Works; vice-president, E. L. Langworthy, Adams & Westlake Company; treasurer, Thomas Evans, Eynon Evans Mfg. Company; secretary, J. H. Paswaters. Councillors, J. H. Schwacke, Wm. Sellers & Co., Inc.; Lawrence Dickey, Lawrence Gas Fixture Company; F. M. Cresson, Geo. V. Cresson Company; Stanley G. Flagg, Jr., Stanley G. Flagg & Co.; Geo. L. Markland, Jr., Philadelphia Gear Works; Wm. F. Sauter, Williamson Bros. Company.

Pacific Coast.

Announcement was made last week of arrangements for a meeting on March 13 of the Portland, Ore., members of the United Metal Trades Association of the Pacific Coast, with F. K. Copeland, Sullivan Machinery Company, Chicago, president of the National Metal Trades Association. The Seattle, Wash., members of the Pacific Coast Association had made arrangements for a banquet to Mr. Copeland at the Hotel Washington, Seattle, March 15. Later it was expected that Mr. Copeland would meet the Spokane members in that city. The annual meeting of the United Metal Trades Association of the Pacific Coast will be held at Everett, Wash., April 24.

Australian Notes.

The iron bounty bill, under its new title of "A Bill for an Act for the Encouragement of Manufacturers in the Commonwealth," has at last become law. The reaper and binder clause has been eliminated, and the measure provides for the payment of £150,000 in respect of (1) pig iron made from Australian ore, (2) puddled bar iron made from Australian ore, and (3) steel made from Australian pig iron, all at the rate of 12 shillings per ton.

It also provides for a payment of £30,000 in respect of (1) galvanized sheet or plate iron or steel (whether corrugated or not) made from Australian ore, (2) wire netting (not prison made) and made from Australian ore or from wire manufactured in the United Kingdom, (3) wire made from Australian ore, (4) iron or steel tubes (not riveted or cast) not more than 6 in. internal diameter, made from Australian pig iron or steel, all at the rate of 10 per cent. on value.

The bounty for pig iron must be claimed before June 30, 1914, and not more than £30,000 will be paid in any one year. In the 10 per cent. list the bounty expires June 30, 1912. The act takes effect from January 1, 1909.

The Victorian Railways have let a contract for 455 tons of fish plates to the Australian Iron Works at Lithgow, N. S. W. The price works out at £9 7s. per ton, and the contract was placed with a view to aiding the Australian iron industry. The Lorain Company, of the United States, tendered a lower rate, and the Australian price is equivalent to a concession of 10 per cent. on the Lorain price, plus duty. The Lorain Company has secured a contract for 65 miles of 80-lb. rails.

East Indian pig iron from the Bengal Iron & Steel Company, Calcutta, has won a footing in Australia. It is 10 or 15 shillings per ton cheaper than corresponding grades of British pig iron.

William Sandford, who for years was Australia's most energetic ironmaster, has received his own portrait in oil as a testimonial. The Lord Mayor of Sydney made the presentation on behalf of Mr. Sandford's many friends.

Foreign Trade Expansion.

The promotion of foreign trade is receiving special attention from the National Association of Manufacturers, whose headquarters are at 170 Broadway, New York. Aggressive methods will be employed to expand the sale of American goods in foreign markets. An export paper will be published, and will be printed in both English and Spanish. It will be circulated among the actual buyers, known to the large membership of the association in every quarter of the globe. James L. Ewell, formerly with R. G. Dun & Co., the mercantile agency, has severed his connection with the agency and joined the National Association of Manufacturers, to continue the work of building up on broad lines the foreign business of American manufacturers. He will give special attention to developing the export journal, and will also assist in extending the system of clearing foreign credit information already established by the association. His long experience in credit reporting will bring to the association valuable aid and a wide range of credit news sources, based upon a complete interchange system. The methods of credit reporting have not kept pace with the advance in commerce on other lines, and the association is now making great additions to this branch of its important service.

Beginning with a proper presentation of the article and furnishing expert advice on all matters pertaining to the extension of trade—namely, patents and trademarks, foreign market reports, lists of foreign buyers, translations, foreign credit reports, customs tariffs, shipping and forwarding, the collection of debts, &c.—the work will form a complete chain from the production end to the return of the proceeds of sales to the cash till.

An Exhibition of United States Industries in Chile.

An exhibition of United States industries will be held at Santiago, Chile, in October and November, 1909, under the auspices of the South American Exhibit Company, which has established offices at 27 William street, New York, and is now arranging with American manufacturers to exhibit their products. The exposition has the sanction of the Chilian Government, and the United States Government is also lending its help through the Department of Commerce and Labor and its Consular Department. The movement is a result of an agitation begun by the Consul General to Chile some time ago who circularized American manufacturers, calling their attention to the advantages of establishing better trade relations with Chile.

Several large buildings, which were used in an exhibition held in Santiago by the Government, have been turned over to the Exhibit Company for the use of American manufacturers. One of these buildings has been set aside for the exhibition of liberal arts and general machinery. A feature of the exhibition will be that it will be free to the public, and all goods for exhibition purposes will be admitted into Chile free of duty. The company will furnish interpreters to assist exhibitors in explaining their goods, and will also furnish printed matter in Spanish describing the articles shown.

On the Ashland division of the Chicago & Northwestern 1000 new steel ore cars are to be put in service within the next few months. There are already about 500 such cars used by this road on the Gogebic range.

Pig Iron Making in Ontario.

Concentrated Native Magnetites as the Basis.

The amount of public reinforcement given to the iron industry of Canada is well indicated by the character of the Canadian Government publications dealing with iron mining and metallurgy. It is quite in line with the payment of bonuses on iron and steel of domestic manufacture that Canada should make a lavish outlay on publications minutely describing her mineral resources and the progress made in their development. The contrast is sharp with the policy pursued in some of our States. Alabama, for example, with all that has been said, and justly, about her mineral resources, has for several years withheld the paltry amount asked for by its Geological Survey to publish data concerning her iron deposits and her advance in ironmaking. Recently a review was given in these columns of the voluminous and admirable "Report on the Mining and Metallurgical Industries of Canada, 1907-8," coming from the Dominion Department of Mines, Mines Branch, at Ottawa. The volume now before us,* while it is an annual report, is made of special value by its elaborate chapters on the "Iron Ranges East of Lake Nipigon" and "The Iron and Steel Industry of Ontario." The former appear in two parts, the first dealing with the iron ranges of the Sturgeon River region and the latter with those around the headwaters of Red Paint River. The geology of both these districts is described with plentiful illustration. The investigations have not been carried far enough to indicate definitely the character of the various deposits and very little as to their extent is given in the present volume, the investigators dealing largely with outcrops.

The section on "The Iron and Steel Industry of Ontario," by George Cleghorn Mackenzie, consists of 150 pages, the earlier portion of which is given up to a historical and statistical review. Concerning the production of iron ore in Ontario, figures for 10 years are given showing shipments of 27,409 tons in 1898, increasing to a maximum of 359,288 tons in 1902, due largely to shipments from the Helen mine. Later shipments declined, being only 53,253 tons in 1904, but increasing to 211,597 tons in 1905. They were 128,049 tons in 1906 and 205,295 tons in 1907. Only the Helen mine has been worked on a large scale, though five other iron mines are producing. The Moose Mountain promises to be a large shipper eventually. At the Atikokan mine, 128 miles west of Port Arthur, shipments were suspended in 1907, owing to the shutting down of the Atikokan Iron Company's blast furnace at Port Arthur. This mine, which yields a magnetite running 60 per cent. metallic iron and containing pyrrhotite and pyrite, has already been described in these columns. At the time the report was written the production of iron ore from Eastern Ontario amounted to about 8000 tons a month, all coming from the Wilbur and Mayo mines and being shipped to Canadian furnaces at Sault Ste. Marie and Midland, Ontario, and Radnor, Quebec. The Mayo mine and other ore bodies at Bessemer, in Mayo township, on the Central Ontario Railroad, are owned by the Mineral Range Iron Mining Company. An average analysis of the ore shipped from these properties shows 54.29 per cent. iron, 9.84 per cent. silica, 2.02 per cent. alumina, 0.019 per cent. phosphorus, 0.38 per cent. manganese, 1.35 per cent. magnesia, and 0.062 per cent. sulphur. The Wilbur mine, which is about 60 miles north of Kingston, yields a magnetite averaging 50 per cent. in iron, though this can be brought up to 55 per cent. by sorting.

Magnetic Concentration.

Mr. Mackenzie devotes a large part of his report to the magnetic concentration of iron ores. With much detail of illustration, concentrating and briquetting operations are explained, and the construction of machinery for these purposes described. Visits were paid to the iron mines and concentrating plants in the Champlain District of New York, and the equipment and resultant product are described at length, as well as the operations at Standish and Port Henry furnaces, which are largely burdened with Chateaugay and Mineville concentrates. The concentrating plant of the Pennsylvania Steel Company at Lebanon, Pa., is also described as well as the connected nodulizing plant. It is stated that a considerable fuel economy is secured at Lebanon by the use of nodulized small ores, the furnaces when burdened with a liberal percentage of this material running more uniformly and with less trouble than when using straight roasted Cornwall ores.

To show that low grade Ontario magnetites may be concentrated by means of the electric magnet and to ascertain the percentage of separation to be expected in commercial operation, samples of ore were taken from various localities in the province and submitted to preliminary testing. Tables are given showing in each case the treatment of crude ore, concentrates, tailings and the efficiency of the operation. It is stated that the concentrates from all the Ontario ores used in these tests would probably require nodulizing or briquetting before being used for smelting. For Gröndal concentrating and briquetting plants treating 1000 tons of crude ore in 24 hr., the cost of the former is figured at $85,100, of the briquetting plant at $186,000, and of the power plant at $25,000. With the proper addition for working capital it is estimated that $350,000 would be required. It is figured that 1000 tons of crude ore averaging 40 per cent. iron is delivered to the mill every 24 hr. at $1.25 a ton, that two tons of crude ore are required to make one ton of concentrates, allowing for a loss of 12 per cent. in the tailings; and that 500 tons of concentrates are produced averaging 68 per cent. of iron, making about 520 tons of briquettes containing 65 per cent. iron. The cost of one ton of briquettes is figured as follows:

Two tons of crude ore	$2.50
Concentrating	.50
Briquetting	.65
Depreciation and amortization at 15 per cent. on $350,000.	.35
Total	$4.00

Adding $1.25 freight by rail and boat to lower lake port and 10 cents a ton royalty, the total cost is $5.35 for a 65 per cent. ore, or 8.23 cents per unit. The estimated selling price is $6 a ton, and on an annual output of 150,000 tons a profit of $97,500 is figured. A comparison of the above with the average selling price of Lake Superior ores over a period of years would indicate that a concentrating plant operating as indicated on Ontario ores would run at a loss rather than at a profit, if it attempted to meet the competition of lake ores. Further, if it were contemplated to send such concentrates into the United States the duty of 40 cents a ton would need to be added, under present tariff schedules.

Pig Iron Costs.

In the latter part of Mr. Mackenzie's report a detailed calculation is given by a firm of blast furnace engineers of the cost of a blast furnace to use eastern Ontario magnetic ores, and of a connected by-product coking plant. The locations considered are Kingston and Trenton, both on Lake Ontario. It is assumed that 50 to 60 per cent. of the ore mixture will consist of nodulized or briquetted concentrates costing $4 at the furnace, and that the balance of high sulphur ores when roasted will cost approximately $2.60 a net ton at the furnaces. An average output of 250 tons a day is estimated. The cost of the furnace is put at $700,000 and of the by-product coke plant at $775,000, a total of $1,475,000. The average market price of No. 2 foundry iron at the furnace is figured at $16.75 and the cost at $15.64. The yearly profit from pig iron is computed to be $95,737.50, and that from the coke plant, $166,014; to these the bounty of $77,625 is added, making a total of $339,376.50, or 23 per cent. on the investment. The author, however, considers the market price used as the basis of comparison too low. From consumers of foundry iron, he says, he finds that the minimum paid in 10 years was $17 a ton delivered at their works, and the maximum $25. It is therefore considered that $19 is a fair average price. It may be suggested that if the metal working interests of Ontario are to be developed in any large way they must be based on cheaper pig iron than seems to be attainable through the utilization of local ores, and that, too, without any allowance for bounty, since that is bound to be but temporary.

* Seventeenth Annual Report of the Ontario Bureau of Mines. Paper bound; 356 pages; illustrated. Published at Toronto, Ontario

The Labor Situation.

Anthracite Wage Conference—An Advance for Puddlers.

A conference was held at Philadelphia March 12 between the subcommittees of the anthracite mine workers and the operators to arrange a new agreement to go into effect April 1. President Lewis of the United Mine Workers reviewed the various demands of the men—which are, briefly, recognition of the union, an increase in wages and the collection of union dues by the companies by deductions from wages—particularly emphasizing the question of recognition. He said that his committee represented the organized mine workers, and in this conference spoke strictly for the anthracite workers, with no attempt to subordinate the anthracite to the bituminous interests. The operators reiterated their intention to deal with the committee as representatives of the anthracite mine workers and not as officers of the union. They renewed their offer to continue the present agreement for three years. This proposition will be placed before a convention of the miners of the three anthracite districts, which will be held in the near future. Later another conference will be held between the subcommittees which met last week. While the prospects do not seem bright for a peaceful settlement, hope of an adjustment is not given up. It has been intimated that the men may continue at work after March 31 without an agreement, striking at the various mines as grievances come up, this being the procedure prior to the strike of 1902.

The Court of Appeals of the District of Columbia handed down a decision March 11 in the injunction case of the Buck Stove & Range Company, St. Louis, against the American Federation of Labor. It modifies and affirms the decree of Justice Gould of the Supreme Court of the District enjoining the Federation and its officers from conspiring to boycott the Bucks Stove & Range Company and from referring to it in the *American Federationist* in the "We Don't Patronize" or "Unfair" list. The court holds that the defendants cannot be restrained from all publications referring to the above company, but only such as are made in furtherance of an illegal boycott. In partly dissenting, Chief Justice Shepard expresses the opinion that the decree should be modified "so as to restrain the acts only by which other persons have been or may be coerced into ceasing from business relations with the Bucks Stove & Range Company; but so as not to restrain the publication of the name of that company in the "We Don't Patronize" column of the *American Federationist*, no matter what the object of such publication may be suspected or believed to be." The decision does not settle the appeal in the contempt proceedings in which Messrs. Gompers, Morrison and Mitchell were given jail sentences. This case will be heard later by the Appellate Court.

Wages of puddlers employed in rolling mills in the Central West that sign the Amalgamated scale will be advanced for March and April from $5.25 to $5.37½ per ton, and finishers will receive an advance of between 1 and 2 per cent. It was found that the average price on shipments of iron bars in January and February was 1.36 cents, against 1.34 cents in November and December, which entitles the men to the advances noted. Wages of sheet and tin mill workers in March and April will remain the same as in January and February.

Announcement has been made by the Pennsylvania Steel Company, Steelton, Pa., and the Maryland Steel Company, Sparrows Point, Md., of a reduction in wages and salaries amounting approximately to 10 per cent., which will become effective April 1. It is understood that the reduction affects all salaries from that of the president down, as well as the wages of all employees in operating departments.

A Reading, Pa., dispatch says that at a conference held there March 15 between national officers of the Amalgamated Association of Iron, Steel and Tin Workers and representatives of the lodges in the Eastern District, it was decided not to accept the reductions proposed by Eastern iron manufacturers. The matter was put in the hands of the Executive Committee of the Eastern District, which will meet at the call of the district vice-president.

A Manufacturer's Theory of Overhead Costs.

In *The Iron Age* of February 20, 1908, the relative merits of the average productive hour and the percentage systems of apportioning overhead expense over the product in manufacturing were editorially discussed. This subject has recently been treated in an interesting manner in a letter written by James N. Heald of the Heald Machine Company, Worcester, Mass., in reply to a request for his views by a brother manufacturer. Mr. Heald says:

"The important part of a cost system is the proper determination of what the overhead charges should be, and how they should be obtained and distributed. It is the writer's opinion, however, that more people are making the mistake of figuring overhead expenses too small than too large. There are innumerable leaks and innumerable small items of expense which come along in the conduct of a business, so that, unless everything goes through a stores department and is issued absolutely to some definite account, the amount will be lost sight of and not show up in the figuring of the overhead expenses, or, what is equally as bad, is to have it in the percentage and not know on what operation or part of the work it really applied.

"The labor cost is not difficult at any time to obtain, although we think the method we use of ringing out on cards with a time clock is the best that has been figured out for a shop of ordinary size at the present time.

"The cost of material can be readily obtained if the material is sent through a stores department, and is issued out against definite lots of machines, or a definite shop order covering the identical part being made up.

"The factor overhead, or expense, as some call it, can be figured in two ways; either as a percentage on the cost of the labor or on a productive hour basis. In our opinion, having used both, the latter is the modern and satisfactory method in connection with men working on day pay. The reason possibly we can explain briefly.

"If a concern pays $10,000 a year for labor and also pays $10,000 for the running expenses, such as salaries, rent, taxes, insurance, heat, power, light, &c., then by the pencentage method you would double the cost of labor, enough in that case to get you the cost of manufacture plus, of course, the cost of material. If the overhead expenses were one-half of the labor bill, your percentage would be 50 per cent. to add to labor instead of 100 per cent. In the productive hour basis you divide the overhead expenses per month, or per year, by the number of productive hours per month or per year. We do this per month, which we think is far preferable. That is, we take the sum of money that is spent each month for the items above mentioned, and divide it by the number of hours the men in the shop are actually working on goods to be sold, and this gives us a certain number of cents per hour, as the expense or overhead charge and add to the workmen's pay per hour to support the factory in operation. If, for instance, the average workman's pay is 25 cents per hour, you might get a productive hour rate of 20 cents per hour or 25 cents per hour, or, if the shop was running very efficiently, says 15 cents per hour.

"In figuring costs by this method our cost records show the number of hours and the money paid to each workman who works on the part. They also show what the productive hour rate was at that time. If three or four men work on a piece of work aggregating 40 hr., the labor cost would amount to a certain sum. The overhead charge would then be 40 hr. into the overhead rate of 20 cents, or $8, which, added to labor cost, plus the cost of material used, would give the manufacturing cost of that part.

"Now, to illustrate why this is better than the percentage, I would say, first, that if you were building in your factory two kinds of machinery, one high grade

and one low grade, a man you pay 15 cents an hour requires just as much supervision, heat, power and light as a man whom you are paying 30 cents an hour. If, however, in figuring the cost of his work or selling an hour of his time, you double the 15 cents, you receive only 15 cents to pay your overhead expenses, while on the 30-cent man if you sell an hour of his time you would be charging 30 cents to pay your overhead expenses for an hour of his time. In other words, in figuring the costs, you would get twice as much off the expensive man to pay your overhead as off the other, while on the productive hour basis you would add, say, 20 cents an hour to the 15-cent man, thus making 35 cents an hour for his time, and 20 cents to the 30-cent man, or making 50 cents an hour for his time, in each case getting 20 cents for an hour of each man's time to pay your overhead expenses.

"By the percentage basis you would be continually underselling the market on your cheaper machines, because you have not figured in enough of the overhead expense to have it bear its proportion, while on your expensive machine you would be continually above the market and unable to meet competition, because you were overloading that line of machines with a greater proportion of the overhead cost than belongs to them.

"Another illustration of the error of percentage figuring is seen in the case of performing a certain operation done by a man to whom we paid, say, 17 cents per hour; later on this man was busy, and the work was given to another man, to whom we paid 22 cents. It turned out that when the job was done, occupying, say, three or four days, exactly the same money was paid for the work, which means that a higher priced man had done it enough quicker so that the rate multiplied by the time was the same in each case.

"On the percentage basis of figuring costs you would see absolutely no difference in the cost of the part, whichever man did the work. On the productive hour basis you see a marked difference, because there was one whole day less time required. That means, of course, less productive hours and reduces the cost of the piece.

"It is very simple to obtain monthly the sum to be divided by the productive hours; it is a simple matter to obtain monthly the number of productive hours, and then you know continually exactly how the factory is running. If the number of workmen is small, the productive hour rate will go up at once, and your cost price will show. If the number of men is increased, and the overhead expenses remain on the same basis, the productive hour rate will drop and you will see immediately the reduction in the manufacturing cost of the work being done."

The British Iron Trade Still Lagging.

As might be judged, the influence of recent developments in the iron markets of the United States and Germany has been unfavorable to the iron trade in Great Britain. However, March has brought out a little more buying of pig iron in the Cleveland District, and buyers paid in the first week of this month a little more for prompt deliveries than in the preceding fortnight. No. 3 Cleveland pig iron sold on March 5 at 47 shillings 3 pence, with warrants at 47 shillings. These prices represented a decline of 3 shillings 6 pence from those of one year previous. The shipments of Cleveland pig iron in February were but 67,487 tons, while in February, 1908, they were 130,488 tons, and the best month of 1908 showed a total of 178,000 tons. The February average for 10 years was 86,919 tons. The increase of pig iron stocks in Connal's stores in February was 16,902 tons, the total at the end of the month being 173,309 tons. Makers' stocks have also increased, but there are no statistics. The demand for pig iron from Europe was only 39,000 tons in February, while in the high month, May, 1907, these shipments were more than 134,000 tons.

A reduction of 5 shillings has been made in the price of iron plates and angles in the north of England, and they are now quoted £6 15s. Steel ship plates remain at £6. A slightly better inquiry for shipbuilding material is noted as new work is undertaken at the shipyards. Rails show more activity than some other finished lines. Heavy sections now sell at £5 5s. Iron bars are weak at £5 15s. in the Midlands. The Scotch steel makers had a meeting early in March, but made no change in prices, though some manufacturers favored a reduction. The principal encouragement in the Scotch steel trade comes from the feeling that the bottom has been touched, though no definite signs of betterment are yet in evidence.

The Steel Corporation's Annual Report.

The seventh annual report of the United States Steel Corporation covering the fiscal year ending December 31, 1908, was made public March 17. It shows total earnings for the year of $91,847,710.57. After deductions of $16,965,181.46 for sinking funds, depreciation and extinguishment funds and extraordinary replacement funds, the net earnings were $74,882,529.11. After deductions for interest and dividends the surplus net income for the year was $10,342,986.70. The total undivided surplus December 31, 1908, was $133,415,214.

Of the $50,000,000 heretofore appropriated from surplus for the Gary, Ind., plant the expenditures have been $42,797,230, leaving a balance of $7,202,770. The expenditures for Gary in 1908 were $18,733,841, and the total expenditures for additional property and construction in the year were $49,422,697, including $3,460,993 for the Tennessee Coal, Iron & Railroad Company and the above amount for Gary.

The total capacity of the Steel Corporation properties on January 1, 1909, is put at 14,990,000 gross tons of pig iron, 17,070,000 tons of steel ingots, 12,900,000 tons of rolled and other steel and iron products and 6,100,000 barrels of cement. In the 18 months ending December 31, 1908, the subsidiary companies of the corporation increased their open hearth steel capacity by 3,052,000 tons, including 500,000 tons of steel capacity controlled by the Tennessee company. In the same period the Bessemer steel capacity of the subsidiary companies was reduced by 746,000 tons.

The balance sheet December 31, 1908, shows current assets of $239,222,176 (against $274,411,308 December 31, 1907), including $49,548,053 cash (against $53,963,849 December 31, 1907), $40,909,650 bills and accounts receivable, $4,823,800 bonds and stocks, and $143,179,629 inventory. The current liabilities were $43,031,854, including $20,858,014 current accounts payable and payrolls and $20,409,494 accrued taxes and interest and unpaid dividends.

The total output of rolled and other finished steel products for sale in 1908 was 6,206,932 gross tons, against 10,564,537 tons in 1907.

The exports of rolled and other finished steel products in 1908 were 777,276 gross tons, against 1,014,014 tons in 1907. The exports of pig iron and scrap were 21,898 tons in 1908 and none in 1907.

G. W. McClure, Son & Co., Bessemer Building, Pittsburgh, have received a contract for four 22 x 90 ft. McClure hot blast stoves, to be erected at Grace Furnace of the Brier Hill Iron & Coal Company, Youngstown, Ohio. Four smaller stoves at this stack will be torn down. The firm has also received a contract from the River Furnace & Dock Company, Cleveland, Ohio, for four 22 x 95 ft. three pass hot blast stoves, and is also building three stoves of this type for the Colonial Iron Company, Riddlesburg, Pa., and two stoves for the Buffalo Union Furnace Company, Buffalo, N. Y.

The Maxwell-Briscoe Motor Company, through the purchasing department at its main office, Tarrytown, N. Y., is soliciting bids on the material required for its 1910 production schedule of 12,000 automobiles. The details are given in another part of this issue in the company's advertisement, to which attention is called, on account of the unusual feature of advertising in this manner for requirements so far in advance as well as for the very great variety of material desired.

PERSONAL.

Prof. George F. Swain, at present in charge of the department of civil engineering at the Massachusetts Institute of Technology, has been appointed professor of civil engineering in the Graduate School of Applied Science at Harvard University.

Lawrence P. Bennett, member of the American Society of Mechanical Engineers, has been elected for the third time president of the American Chamber of Commerce in Paris. He is the first one to have held that office more than two terms.

Chester B. Albree of the Chester B. Albree Iron Works Company, Allegheny, Pa., has been elected one of the directors of the mechanical section of the Engineers' Society of Western Pennsylvania for the ensuing year.

William H. Hansel, until recently chief engineer of the Standard Roller Bearing Company, Philadelphia, Pa., has opened an office in that city with G. Edward Smith in the Providence Building, for consulting and contracting engineering, under the firm name of the Edward Smith Company.

Edwin G. Russ, formerly vice-president and general manager of the Elks Rapids Iron Company, Elks Rapids, Mich., has accepted a position with the Sheffield Coal & Iron Company, Sheffield, Ala.

W. D. Jordan, formerly superintendent of the Barnesville Glass Company, Barnesville, Ohio, is now connected with the sales department of the Watt Mining Car Wheel Company, Barnesville, Ohio.

L. A. Crandall, late vice-president of the Detroit Foundry Supply Company, has severed his active connection with that concern to accept a position with the J. W. Paxson Company, Philadelphia, Pa., as manager of its Western branch, where a full line of foundry equipment, supplies and facings will be carried in stock for prompt shipment.

Joseph McDonald, assistant district superintendent of the Carnegie Steel Company's mill and furnaces, and Fred. E. Morton, chief engineer for the William Tod Company, Youngstown, Ohio, sailed from New York March 6 on a two months' European tour. They will visit some of the great works in Germany and England.

George F. Fenno, formerly insurance engineer with the Middle States Inspection Bureau, an organization maintained by 36 fire insurance companies, has joined the staff of the Geo. H. Gibson Company, technical advertising, Tribune Building, New York City. Mr. Fenno is a graduate of Sibley College, Cornell University.

Edw. P. Coleman, general manager of the Great Northern Power Company's hydro-electric development at Duluth, has been appointed manager of railroads of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont.

A. W. Limont, formerly electrical engineer of the New York Public Service Commission, has taken charge of the Chicago & Milwaukee Electric Railway as general manager.

Chas. L. Gasper, a graduate of the University of Wisconsin, and who was afterward engaged as mechanical engineer by the Wisconsin Central Railroad, has been appointed superintendent of motive power on the Canton-Hankow Railroad in China.

J. E. Fries, formerly engineer of the Allis-Chalmers Company's contracting department, and recently of the Canadian General Electric Company, has entered the employ of the Crocker-Wheeler Company, Ampere, N. J.

William Martin, well known in engineering circles, has joined the forces of the Kennedy Valve Mfg. Company as manager of the New York City sales department, with offices at 57 Beekman street.

Dr. Franz Meyer, long connected with the Metallurgical Company of America, at New York, has resigned to enter the firm of R. Wedekind & Co. of Uerdingen, Germany.

A. Eugene Michel, who as manager of a technical advertising organization has for the past few years been identified with the publicity of numerous large manufacturing concerns, has opened new offices at 1572 Hudson Terminal Buildings, New York. He will hereafter confine his efforts to the promotion of steam specialties and apparatus, power transmission appliances and machine tools, and will limit his clientele to the number of firms to whose work he can give personal attention. Among the accounts which he will handle are the following: Watson-Stillman Company, Bird-Archer Company, Diamond Chain & Mfg. Company and James Beggs & Co.

John Birkinbine, consulting engineer, Philadelphia, has returned from an eight weeks' absence in Mexico.

George T. Oliver, for some years president of the Oliver Wire Company, Pittsburgh, at present a director in the Oliver Iron & Steel Company and also president of the Youngstown Car Mfg. Company, Youngstown, Ohio, has been named as the Republican candidate for United States Senator from Pennsylvania, to succeed P. C. Knox, appointed Secretary of State.

Henry F. Gilg, formerly secretary of the Refined Iron & Steel Company, Pittsburgh, has been appointed sales manager of the Sligo Iron & Steel Company, Connellsville, Pa.

J. W. Bray, who formerly represented the Bullard Machine Tool Company in the New England territory, but for the past year or so has been located in Philadelphia, has returned to headquarters at Bridgeport, Conn., and will travel the New England territory, R. H. Snider taking charge of the Philadelphia office at 1414 South Penn square.

W. L. Saunders, president of the Ingersoll-Rand Company has been appointed a member of a special committee of the Chamber of Commerce of the State of New York to prepare a report on the Panama Canal. The committee will probably review the findings of several engineers on the question of the merits of a sea level canal as against a lock canal, and will investigate the advantages of the canal to American commerce and will likely report on the questions of the benefits to be derived from the canal in the future.

D. F. Geissinger, formerly of the Pittsburgh office of the Chicago Pneumatic Tool Company, is now manager of the New York office of the company, succeeding Charles Booth, who was recently elected vice-president and who has moved to the main office at Chicago.

Dr. Hjalmar Lundbohm, formerly geologist for Sweden and at present representing the Kürunavaara Company, having large iron ore properties in Sweden, and Chief Engineer Inar Krantz of the same company are visiting this country for about six weeks, stopping at the Hotel Knickerbocker, New York. Dr. Lundbohm is interested in technical education for mechanics and will make some observations on that subject in this country.

Lieut.-Col. George W. Goethals, chairman and chief engineer of the Isthmian Canal Commission, will sail on the Hamburg-American Line March 27 for Panama.

Hugh McCulley, for some years superintendent of the cold rolled department of the Jones & Laughlin Steel Company, Pittsburgh, has retired after a continuous service of nearly 41 years. His connection began in September, 1868, as a machinist. The heads of departments and superintendents of the several plants of the company presented him with a horse and carriage, while the workmen in the machine shop gave him two leather chairs. William M. Brobeck, who has also been connected with the company in various capacities since September, 1868, and since 1884 actively connected with the cold rolled and cold drawn departments, has also retired. The heads of departments and superintendents presented him with two leather chairs and the employees of the cold rolled department gave him a gold watch and chain.

Benjamin Nicoll of B. Nicoll & Co., New York, who has been ill with bronchitis, has started for Jacksonville with the Gould party for a yachting tour in the Antilles.

The Commercial Club of Rensselaer, Ind., is raising a fund of $25,000 by the sale of lots, the proceeds to be used in inducing factories to locate there.

NEWS OF THE WORKS.

Iron and Steel.

The plans of the Provincial Steel Company, Ltd., Cobourg, Ontario, incorporated some months ago, are understood to include the erection of a rail rerolling mill at Cobourg.

The Massillon Rolling Mill Company, Massillon, Ohio, which is erecting a new sheet mill, has been incorporated with a capitalization of $200,000 by James J. Clark, Thomas E. Belding and others. The company's new plant is nearing completion.

The Southern Iron & Steel Company has been incorporated with a capital stock of $17,000,000, of which $7,000,000 is preferred and $10,000,000 common stock. The company will also issue $10,000,000 of 20-year gold bonds bearing interest at 4 per cent. for five years and 5 per cent. thereafter. This company is to take over the properties and business of the Southern Steel Company, the plan for whose reorganization was recently outlined in these columns.

Bridges and Buildings.

The Standard Tin Plate Company, Canonsburg, Pa., which is adding four hot mills to its plant, has also placed a contract with the Fort Pitt Bridge Works, Pittsburgh, for a steel frame building, 50 x 100 ft.

General Machinery.

Current reports greatly exaggerate the size of the shop buildings to be erected at Lyons, N. Y., by the New York Central Railroad, to replace those recently destroyed by fire. The company maintains only a repair yard at that point and contemplates rebuilding the structures which were recently burned.

The machine shop, foundry and stock of the Morgan Iron Works, Spartanburg, S. C., have been purchased by Isaac Andrews and B. F. Macauley, who will operate the plant under the name of the Andrews-Macauley Iron Works, doing a general machine shop and foundry business. The company will also build special machinery and carry a full line of fittings, shafting, &c. Although definite plans have not been made, it is probable that the plant will be somewhat enlarged.

The Roof Engine Company, Muncie, Ind., recently organized, has installed a plant to manufacture gas and gasoline engines of a new design. While it has most of the equipment it expects to add a few additional lathes. Robert M. Roof is president; James M. Quick, secretary and treasurer, and F. E. Hill, manager.

The Huntington-Bargar Machine Company has been incorporated at Jamestown, N. Y., with a capital stock of $5000, to manufacture engines and machinery. The incorporators are Wm. Huntington, Lewis T. Bargar and J. Delevan Curtiss.

S. A. Crozer & Son, Chester, Pa., are to erect a new machine shop, the present shop to be converted into an addition to the cloth finishing department.

The Mesta Machine Company, Pittsburgh, works at West Homestead, Pa., has received a contract from the Shenango Furnace Company, Sharpsville, Pa., for an 800-hp. cross compound blowing engine for direct connection to a 500-kw. generator.

The Hardwick-Abbot Mfg. Company, Dallas, Texas, machinist and founder, incorporated with a capital stock of $20,000, has taken over and consolidated the Greenville Foundry & Machine Company of Greenville and the Machinery Mfg. Company, Dallas, Texas. It is the purpose of the new organization to do a general iron and brass foundry business and machine shop work. The incorporators are S. W. Hardwick, H. B. Abbot and John M. Spellman.

C. A. Hallin, Tacoma, Wash., manufacturer of gasoline engines and launches, is seeking a water front location for a new machine shop, which is needed to handle the heavier machines now being built and increasing volume of business.

The Missouri, Oklahoma & Gulf Railroad contemplates the erection of machine shops and offices at Sherman, Texas. E. J. Noonan, with headquarters at Muskogee, Okla., is chief engineer.

The Williams-Hughes Company, Lancaster, S. C., desires prices on an ice manufacturing plant of from 10 to 20 tons capacity.

Recent orders of the Crocker-Wheeler Company, Ampere, N. J., include a 500-kw. generator for the Shenango Furnace Company, Sharpsville, Pa.; 225-hp. induction motor, Youngstown Sheet & Tube Company, for the wire mill at Struthers, Ohio; 100-hp. shunt wound motor, American Car & Foundry Company, St. Louis, Mo.; 60-hp. motor, Bridgeport Brass Company, Bridgeport, Conn., for plating department.

The Pittsburgh office of the Alliance Engineering Company, Alliance, Ohio, has recently secured the following orders: Petroleum Iron Works, Sharon, Pa., two 15-ton cranes; Pittsburgh Plate Glass Company, Crystal City, Mo., one 10-ton special crane, and Ohio Works, Carnegie Steel Company, Youngstown, Ohio, two 10-ton special cranes.

The Franklin Machinery Company, Franklin, Pa., has been organized under a Pennsylvania charter with $50,000 capital, to manufacture and deal in machinery. The directors are E. W. Snook, J. P. Coffman and H. A. Clawson.

The Thomas Steel Company, Niles, Ohio, is making some further improvements to its plant and has placed an order with the Case Mfg. Company, Columbus, Ohio, for a 35-ton crane.

Foundries.

A new foundry plant is being erected at South Houston, Texas, by the Pitts Foundry & Contracting Company, which will make a specialty of fine gray iron castings. Besides the main foundry building, which will be 80 x 125 ft., there will be a cupola house, core house, core ovens, pattern shop and a building for tumbling and cleaning castings. The foundry will be equipped with a 15-ton traveling crane, five 2-ton trolleys and other modern machinery necessary to handle work in an up to date manner. It is expected that the foundry will be in operation about April 1.

The Central Foundry Company has not yet completed plans for the new structures it will erect at Anniston, Ala., to replace the main foundry buildings which were recently destroyed by fire. The engine and boiler house was not destroyed.

The Mt. Holly Iron Works Company, Mt. Holly, N. J., will erect a new foundry to make small castings and plumbers' supplies. Grover C. Johnson is secretary and treasurer.

The Diamond Iron Works, Milwaukee, Wis., has sold to the city of Minneapolis 200 tons of special iron castings for sewer construction.

The Lavelle Foundry Company, Anderson, Ind., has increased its capital stock from $5000 to $10,000.

The Bollinger & Andrews Company, Empire Building, Pittsburgh, works at Verona, Pa., recently made shipment of a number of large castings, among which were several cast iron linings for cinder ladles to be used about blast furnaces. The ladles are 10 ft. 6 in. wide by 8 ft. 6 in. in diameter and weigh about 20 tons each.

Power Plant Equipment.

A contract for the installation of a municipal electric light company for Terrell, Texas, to be run in connection with the present water works system has been let to Houston & Cunningham, New Orleans, La. The equipment will include a 66 in. by 16 ft. boiler and 16 x 36 in. Corliss engine built by the Murray Iron Works; 300-hp. Platt heater and a 100-kw. Westinghouse generator.

The Wisconsin Engine Company, Corliss, Wis., has recently completed the installation of a 600-kw. vertical cross compound engine in the Oliver Power Building, Pittsburgh, and has recently shipped two 500-hp. cross compound engines, intended for direct connection to generators, to the Allegheny Valley Street Railway Company, Creighton, Pa. Recent orders include two 400-kw. gas engines for the Bartletsville Electric Light & Power Company, Bartletsville, Okla., and a duplicate order for three 400-kw. gas engines for the Altoona Portland Cement Company, Altoona, Kan.

The Parker Boiler Company, Philadelphia, Pa., has recently received orders for three 300-hp. boilers for the Gardner-Harvey Paper Company, Battle Creek, Mich., and two 234-hp. boilers for the Mount de Chantal Academy, Wheeling, W. Va.

The Board of Aldermen of Jackson, Miss., will receive bids until April 6 for a 6,000,000-gal. high duty pumping engine for the water works.

The Town Council of Oakland, Garrett County, Md., will receive bids until March 29 for the construction of water works and sewerage systems.

The Laycock Power House Company, Indianapolis, Ind., has increased its capital stock from $100,000 to $150,000.

Fires.

The plant of the Cheshire Brass Company, Cheshire, Conn., was damaged $15,000 by fire March 9.

The foundry of J. M. Dutton, Vicksburg, Miss., was burned March 6, the loss being about $12,000.

Hardware.

The Angle Steel Sled Company, which besides the main office and factory at Ostego, Mich., operates a plant and warehouse at Kalamazoo, Mich., is planning to build an additional plant at the former place for the accommodation of its increased business.

The Milwaukee Wire Fence Mfg. Company, Milwaukee, Wis., has removed to larger quarters, having leased the factory at Twentieth street and St. Paul avenue, owned by C. D. Rogers. This is a new concern whose business has grown very rapidly.

The Howler Mfg. Company, Montgomery, Ala., has patented and is now manufacturing the Howler sad iron and the Howler alcohol burning stove. The president of the company is J. C. Virden; R. L. Harmon is vice-president, and W. E. Cochran is secretary.

J. J. Jones, engineer and architect, 1200 Westinghouse Building, Pittsburgh, inventor of the Jones electric sign, reports having contracts for signs as follows: Westinghouse Building, 36-in. letters; Diamond Bank Building, one 48 and one 72 in. letters; Pittsburgh *Dispatch*, one 18-in.; Hotel Lincoln, one 15 and one 36 in.; and the Rittenhouse, one 15-in. The Jones electric sign consists of a metal frame having lamps attached in

Supplement to THE IRON AGE, March 18, 1909.

THE PAYNE TARIFF BILL.

Text of the Metal Schedule of the Tariff Bill Introduced in the House of Representatives, March 17, 1909.

Iron Ore on the Free List.

WASHINGTON, D. C., March 17, 1909.—(*By Telegraph.*)—The new tariff bill was formally introduced in the House of Representatives shortly after noon to-day by Representative Payne of New York, chairman of the Ways and Means Committee. The text of the metal schedule is as follows, the present rates in the Dingley tariff act being given in brackets:

SCHEDULE C. METALS AND MANUFACTURES OF.

115-116. Iron in pigs, iron kentledge and spiegeleisen, $2.50 [$4] per ton; wrought and cast scrap iron and scrap steel, 50 cents [$4] per ton, but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel in such physical form as to be fit only to be remanufactured.

117. Bar iron, square iron, rolled or hammered, comprising flats not less than 1 in. wide nor less than three-eighths of 1 in. thick, round iron not less than seven-sixteenths of 1 in. in diameter, four-tenths [eight-tenths] of 1 cent per pound.

118. Round iron, in coils or rods, less than 7-16 in. in diameter, and bars or shapes of rolled or hammered iron not specially provided for in sections one or two of this act, six [eight] tenths of 1 cent per pound; *provided*, that all iron in slabs, blooms, loops or other forms less finished than iron in bars, and more advanced than pig iron, except castings, shall be subject to a duty of four [five] tenths of 1 cent per pound; *provided further*, that all iron bars, blooms billets, or sizes or shapes of any kind, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of $6 [$12] per ton.

119. Beams, girders, joists, angles, channels, car truck channels, TT, columns, and posts, or parts or sections of columns and posts, deck and bulb beams and building forms, together with all other structural shapes of iron or steel, whether plain or punched or fitted for use, three [five] tenths of 1 cent per pound.

120. Boiler or other plate iron or steel, except crucible plate steel and saw plates hereinafter provided for in sections 1 or 2 of this act, not thinner than No. 10 wire gauge, cut or sheared to shape or otherwise or unsheared, and skelp iron or steel sheared or rolled in grooves [½ cent to 1 cent per pound], 20 per centum ad valorem; *provided*, that all sheets or plates of iron or steel thinner than No. 10 wire gauge shall pay duty as iron or steel sheets.

121. Iron or steel anchors or parts thereof, 1 cent [1½ cents] per pound; forgings of iron or steel, or of combined iron and steel, but not machined, tooled or otherwise advanced in condition by any process or operation subsequent to the forging process, not specially provided for in sections 1 or 2 of this act, 30 [35] percentum ad valorem; antifriction ball forgings of iron or steel or of combined iron and steel, 45 percentum ad valorem.

122. Hoop, band or scroll iron or steel not otherwise provided for in sections 1 or 2 of this act, valued at 3 cents per pound or less, 8 in. or less in width and less than three-eighths of 1 in. thick and not thinner than No. 10 wire gauge, three [five] tenths of 1 cent per pound, thinner than No. 16 wire gauge and not thinner than No. 20 wire gauge, four [six] tenths of 1 cent per pound; thinner than No. 20 wire gauge, six [eight] tenths of 1 cent per pound; *Provided*, that barrel hoops of iron or steel and hoop or band iron or hoop or band steel flared, splayed or punched with or without buckles or fastenings shall pay one-tenth of 1 cent per pound more duty than that imposed on the hoop or band iron or steel from which they are made; steel bands or strips, untempered, suitable for making band saws, hack saws, or butchers' saws, 1½ [3] cents per pound and 20 percentum ad valorem; if tempered, or tempered and polished, 3 [6] cents per pound and 20 percentum ad valorem.

123. Hoop or band iron or hoop or band steel, cut to lengths or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation, with or without buckles or fastenings, for baling cotton or any other commidity, three [5] tenths of 1 cent per pound.

124. Railway bars made of iron or steel and railway bars made in part of steel, T rails, and punched iron or steel flat rails, seven-fortieths [seven-twentieths] of 1 cent per pound; railway fish plates or splice bars made of iron or steel, two [4] tenths of 1 cent per pound.

125. Sheets of iron or steel, common or black, of whatever dimensions, and skelp iron or steel, valued at 3 cents per pound or less thinner than No. 10 and not thinner than No. 20 wire gauge, five [7] tenths of 1 cent per pound, thinner than No. 20 wire gauge and not thinner than No. 25 wire gauge, six [8] tenths of 1 cent per pound; thinner than No. 25 wire gauge and not thinner than No. 32 wire gauge, eight-tenths [one and one-tenth] of 1 cent per pound; thinner than No. 32 wire gauge, nine-tenths [one and two-tenths] of 1 cent per pound; corrugated or crimped, eight-tenths [one and one-tenth] of 1 cent per pound. [New.] All the foregoing valued at more than 3 cents per pound 30 percentum ad valorem; *Provided*, that all sheets or plates of common or black iron or steel not thinner than No. 10 wire gauge shall pay duty as plate iron or plate steel.

126. All iron or steel sheets or plates, and all hoop, band, or scroll iron or steel, excepting what are known commercially as tin plates, terne plates and taggers' tin, and hereinafter provided for, when galvanized or coated with zinc, spelter, or other metals, or any alloy of those metals, shall pay two-tenths of 1 cent per pound more duty than if the same was not so galvanized or coated. [The following provision is new:] Sheets or plates, composed of iron, steel, copper, nickel, or other metal, with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding, 45 percentum ad valorem.

127. Sheets of iron or steel, polished, planished, or glanced, by whatever name designated, 1¾ [2] cents per pound; provided that plates or sheets of iron or steel, by whatever name designated, other than the polished, planished, or glanced herein provided for, which have been pickled or cleaned by acid, or by any other material or process, or which are cold rolled, smoothed only, not polished, shall pay two-tenths of 1 cent per pound more duty than common or black sheets of iron or steel of corresponding gauge or value.

128. Sheets or plates of iron or steel, or taggers iron or steel, coated with tin or lead, or with a mixture of which these metals or either of them is a component part, by the dipping or any other process, and commercially known as tin plates, terne plates, and taggers tin, 1 2-10 [1½] cents per pound.

129. Steel ingots, cogged ingots, blooms and slabs, by whatever process made; die blocks or blanks; billets and bars and tapered or beveled bars; mill shafting material; pressed, sheared, or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; steel saw plates, wholly or partially manufactured; hammer molds or swaged steel; gun barrel molds not in bars; alloys used as substitutes for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam, or iron molded steel castings; sheets and plates and steel in all forms and shapes not specially provided for in sections 1 or 2 of this act, all of the above valued at 1 cent per pound or less, seven fortieths [three-tenths] of 1 cent per pound; valued above 1 cent and not above 1 4-10 cents per pound, three [4] tenths of 1 cent per pound; valued above 1 4-10 cents and not above 1 8-10 cents per pound, five [6] tenths of 1 cent per pound; valued above 1 8-10 cents and not above 2 2-10 cents per pound, six [7] tenths of 1 cent per pound; valued above 2 2-10 cents and not above 3 cents per pound, eight [9] tenths of 1 cent per pound; valued above 3 cents per pound and not above 4 cents per pound, 1 1-10 [1 2-10] cents per pound; valued above 4 cents and not above 7 cents per pound, 1 2-10 [1 3-10] cents per pound; valued above 7 cents and not above 10 cents per pound, 2 cents per pound; valued above 10 cents and not above 13 cents per pound, 2 3-10 [2 4-10] cents per pound; valued above 13 cents and not above 16 cents per pound, 2 7-10 [2 8-10] cents per pound; valued above 16 cents and not above 30 cents per pound, 4 6-10 [4 7-10] cents per pound; [new classification] valued above 30 cents per pound, 15 percentum ad valorem.

130. [New.] Steel wool or steel shavings, 40 percentum ad valorem.

131. [New.] Diamond steel, steel grit, diamond grit, iron form, iron sand, chilled iron sand and similar articles by whatever name known, 45 percentum ad valorem.

132. [New.] The terms iron plates, steel plates, plate iron and plate steel as used in this act shall be restricted to such articles having plain surfaces which may, however, be checkered, corrugated, or ribbed, for use as parts of constructions, but not as tools or implements in manufacturing.

WIRE.

133. Wire rods: Rivet, screw, fence and other iron or steel wire rods, whether round, oval, flat or square, or in any other shape, and nail rods, in coils or otherwise, valued at 4 cents or less per pound, four-tenths of 1 cent per pound; valued over 4 cents per pound, three-fourths of 1 cent per pound; *Provided*, that all round iron or steel rods smaller than No. 6 wire gauge shall be classed and dutiable as wire; *Provided further*, that all iron or steel wire rods which have been tempered or treated in any manner or partly manufactured shall pay an additional duty of one-half of 1 cent per pound.

MANUFACTURES OF IRON AND STEEL.

134. Round iron or steel wire at not smaller than No. 13 wire gauge, 1 cent [1¼] per pound; smaller than No. 13 and not smaller than No. 16 wire gauge, 1¼ [1½] cents per pound; smaller than No. 16 wire gauge, 1½ [2] cents per pound; *Provided*, that all the foregoing valued at more than 4 cents per pound shall pay duty at the rate of 40 percentum ad valorem. All iron or steel wire covered with cotton, silk, or other material, corset clasps, corset steels, dress steels, and all flat wires, and steel strips, strip steel, or steel in strips, twenty-five one thousandths of 1 in. thick, or thinner, whether in long or short lengths, in coils or otherwise, and whether drawn through dies or rolls, and all other wire not specially provided for in sections 1 or 2 of this act, shall pay a duty of not less than 45 percentum ad valorem. On iron or steel wire coated by dipping, galvanizing or similar process with zinc, tin or other metal, there shall be paid two-tenths of 1 cent per pound in addition to the rate imposed on the wire of which it is made. [The following is a new provisional:] *Provided* further, that articles manufactured wholly or in chief value of any wire or wires provided for in this paragraph shall pay the maximum rate of duty imposed in this section upon any wire used in the manufacture of such articles and in addition thereto 1¼ cents per pound, except that wire rope or wire strand shall pay the maximum rate of duty imposed in this section upon any wire used in the manufacture thereof, and in addition thereto 1 cent per pound; and, provided further, that no article composed of wire shall pay a less rate of duty than 40 percentum ad valorem.

GENERAL PROVISIONS.

135. No allowance or reduction of duties for partial loss or damage in consequence of rust or of discoloration shall be made upon any description of iron or steel, or upon any article wholly or partly manufactured of iron or steel, or upon any manufacture of iron or steel.

136. All metal produced from iron or its ores, which is cast and malleable, of whatever description or form, without regard to the percentage of carbon contained therein, whether produced by cementation, or converted, cast, or made from iron or its ores, by the crucible, Bessemer, Clapp-Griffith, pneumatic, Thomas-Gilchrist, basic, Siemens-Martin, or open hearth process, or by the equivalent of either or by a combination of two or more of the precesses or their equivalents, or by any fusion or other process which produces from iron or its ores a metal either granular or fibrous in structure, which is cast and malleable, excepting what is known as malleable iron castings, shall be classed and denominated as steel.

137. No article not specially provided for in this act, which is wholly or partly manufactured from tin plate, terne plate, or the sheet, plate, hoop, band or scroll iron or steel herein provided for, or of which such tin plate, terne plate, sheet, plate, hoop, band or scroll iron or steel shall be the material of chief value, shall pay a lower rate of duty than that imposed on the tin plate, terne plate, or sheet, plate, hoop, band or scroll iron or steel from which it is made or of which it shall be the component thereof of chief value.

138. On all iron or steel bars or rods of whatever shape or section which are cold rolled, cold drawn, cold hammered or polished in any way, in addition to the ordinary process of hot rolling or hammering, there shall be paid one-eighth [one-fourth] of 1 cent per pound in addition to the rates provided in sections one or two of this act on bars or rods of whatever section or shape which are hot rolled; and on all strips, plates, or sheets of iron or steel of whatever shape, other than the polished, planished or glanced sheet iron or sheet steel hereinbefore provided for, which are cold rolled, cold drawn, cold hammered, blued, brightened, tempered, or polished in any way in addition to the ordinary process of hot rolling or hammering, there shall be paid five-tenths of 1 cent [1 cent] per pound, in addition to the rates provided in sections one or two of this act upon strips, plates, or sheets of iron or steel of common or black finish of corresponding gauge or value; and on steel circular saw plates there shall be paid one-half of 1 cent per pound in addition to the rates provided in this section for steel saw plates.

139. Anvils of iron or steel, or of iron and steel combined, by whatever process made or in whatever stage of manufacture, 1⅞ cents per pound.

140. Automobiles and parts thereof, bicycles and parts thereof, and motor cycles and parts thereof, 45 percentum ad valorem.

141. Axles, or parts thereof, axle bars, axle blanks, or forging for axles, whether of iron or steel, without reference to the stage or state of manufacture, valued at not more than 6 cents per pound, 1 cent per pound: *Provided*, that when iron or steel axles are imported fitted in wheels, or parts of wheels, of iron or steel, they shall be dutiable at the same rate as the wheels in which they are fitted.

142. Blacksmiths' hammers and sledges, track tools, wedges, and crowbars, whether of iron or steel, 1½ cents per pound.

143. Bolts, with or without threads or nuts, or bolt blanks, and finished hinges or hinge blanks, whether of iron or steel, 1¼ [1½] cents per pound.

144. Card clothing, not actually and permanently fitted to and attached to carding machines or to parts thereof at the time of importation, manufactured from tempered steel wire, 45 cents per square foot; all other, 20 cents per square foot.

145. Cast iron pipe of every description, one-fourth [four-tenths] of 1 cent per pound.

146. Cast iron andirons, plates, stove plates, sadirons, tailors' irons, hatters' irons, and castings and vessels wholly of cast iron, eight-tenths of 1 cent per pound. [New.] All castings of iron or cast iron plates which have been chiseled, drilled, machined, or otherwise advanced in condition by processes or operations subsequent to the casting process, but not made up into articles, shall pay two-tenths of 1 cent per pound more than the rate imposed upon the castings of iron and cast iron plates herein before provided for.

147. Castings of malleable iron not specially provided for in sections 1 or 2 of this act, nine-tenths of 1 cent per pound.

148. Cast hollow ware, coated, glazed, or tinned, 1½ [2] cents per pound.

149. Chain or chains of all kinds, made of iron or steel, not less than ¾ in. in diameter, seven-eighths of 1 cent [1⅛ cents] per pound; less than ¾ in. and not less than ⅜ in. in diameter, 1⅛ [1⅜] cents per pound; less than ⅜ in. in diameter and not less than 5-16 in. in diameter, 1 6-8 [1⅞] cents per pound; less than 5-16 in. in diameter, 3 cents per pound; but no chain or chains of any description shall pay a lower rate of duty than 45 percentum ad valorem.

150. Lap welded, butt welded, seamed or jointed iron or steel boiler tubes, pipes, flues or stays not thinner than No. 16 wire gauge, if not less than ⅝ in. in diameter, 1 cent [2 cents] per pound; if less than ⅝ in. and not less than ¼ in. diameter, 1½ [2] cents per pound; if less than ¼ in. in diameter, 2 cents per pound. [The following is new.] Cylindrical or tubular tanks or vessels for holding gas or liquids, 30 per centum ad valorem. [The following is new]: Flexible metal tubing or hose not specially provided for in sections 1 or 2 of this act, whether covered with wire or other material, or otherwise, including any appliance or attachments affixed thereto, 30 per centum ad valorem. Welded cylindrical furnaces made from plate metal, 2 cents per pound; all other iron or steel tubes, finished, not specially provided for in sections 1 or 2 in this act, 30 per centum ad valorem.

151. Penknives, pocket knives, clasp knives, pruning knives, budding knives, erasers, manicure knives, knives or razors for cutting corns, and all knives by whatever name known, including such as are denominatively mentioned in this act, which have folding or other than fixed blades or attachments, valued at not more than 40 cents per dozen, 40 percentum ad valorem; valued at more than 40 cents per dozen and not exceeding 50 cents per dozen, 1 cent per piece and 40 percentum ad valorem; all such cutlery, or parts thereof, wholly or partly manufactured, valued at more than 50 cents per dozen and not exceeding $1.50 per dozen, 5 cents per piece and 40 percentum ad valorem; valued at more than $1.50 per dozen and not exceeding $3 per dozen, 10 cents per piece and 40 percentum ad valorem; valued at more than $3 per dozen, 20 cents per piece and 40 percentum ad valorem; *Provided*, that blades, handles, or other parts of either or any of the foregoing articles imported in any other manner than assembled in finished knives or erasers shall be subject to no less rate. Of duty than herein provided for the knives and erasers mentioned herein valued at more than 50 and not more than $1.50 per dozen. Razors and razor blades, finished or unfinished, valued at less than $1.50 per dozen, 50 cents per dozen and 30 [15] percentum ad valorem; valued at $1.50 per dozen and less than $3 per dozen, $1 per dozen and 30 [15] per centum ad valorem; valued at $3 per dozen or more, $1.75 per dozen and

30 [20] per centum ad valorem. Scissors and shears, and blades for the same, finished or unfinished, valued at not more than 50 cents per dozen, 15 cents per dozen and 15 percentum ad valorem; valued at more than 50 cents and not more than $1.75 per dozen, 50 cents per dozen and 15 per centum ad valorem; valued at more than $1.75 per dozen, 75 cents per dozen and 25 percentum ad valorem. Plumbers', painters', palette, artists', and shoe knives, forks and steels, finished or unfinished, if imported with handles of mother of pearl, shell, ivory, silver, nickeled silver, or other metal than iron or steel, 14 [16] cents each; with handles of deer horn, 10 [12] cents each; with handles of hard rubber, solid bone, celluloid, or any pyroxyline material, 4 [5] cents each; with handles of any other material than those above mentioned, 1 cent [1½ cents] each, and in addition, on all the above articles, 15 per centum ad valorem; any of the knives, forks or steels enumerated in this paragraph, if imported without handles, 40 per centum ad valorem; *provided*, that no cutlery other than that provided for in sections 1 or 2 of this act at ad valorem rates of duty shall pay a less rate of duty than 40 per centum ad valorem.

152. Sword blades and swords and side arms irrespective of quality or use, in part of metal, 50 [35] percentum ad valorem.

154. Files, file blanks, rasps and floats, of all cuts and kinds, 40 percentum ad valorem. [Present rates, 30 cents to $1 per dozen, according to length.]

155. Muskets, muzzle loading shotguns, rifles and parts thereof, 25 percentum ad valorem.

156. Double barreled sporting, breech loading shotguns, combination shotguns and rifles, valued at not more than $5, $1.50 each, and in addition thereto 15 percentum ad valorem; valued at more than $5 and not more than $10, $4 each, and in addition thereto 15 percentum ad valorem each; valued at more than $10, $6 each; double barrels for sporting breech loading shotguns and rifles, further advanced in manufacture than rough bored only, $3 each; stocks for double barreled sporting breech loading shotguns and rifles wholly or partially manufactured, $3 each; and in addition thereto on all such guns and rifles valued at more than $10 each, and on such stocks and barrels, $35 percentum ad valorem; on all other parts of such guns or rifles, and fittings for such stocks or barrels, finished or unfinished, 50 percentum ad valorem; *provided*, that all double barrelled sporting breech loading shotguns and rifles imported without a lock or locks or other fittings shall be subject to a duty of $6 each, and 35 percentum ad valorem; single barreled breech loading shotguns, or parts thereof, except as otherwise specially provided for in sections 1 or 2 of this act, $1 each and 35 percentum ad valorem. Pistols, automatic, magazine or revolving, or parts thereof, 75 cents each, and 25 percentum ad valorem.

157. Sheets, plates, wares, or articles of iron, steel, or other metal, enameled, or glazed with vitreous glasses, 40 percentum ad valorem.

NAILS, SPIKES, TACKS AND NEEDLES.

158. Cut nails and cut spikes of iron or steel, five [six] tenths of 1 cent per pound.

159. Horseshoe nails, hob nails and all other wrought iron or steel nails not specially provided for in sections 1 or 2 of this act, 1½ [2¼] cents per pound.

160. Wire nails made of wrought iron or steel, not less than 1 in. in length and not lighter than No. 16 wire gauge, one-fourth [one-half] of 1 cent per pound; less than 1 in. in length and lighter than No. 16 wire gauge, one-half of 1 [1] cent per pound.

161. Spikes, nuts and washers, and horse, mule, or ox shoes, of wrought iron or steel one-half of 1 [1] cent per pound.

162. Cut tacks, brads or sprigs, not exceeding 16 ounces to the thousand, five-eighths of 1 cent [1¼ cents] per 1000; exceeding 16 ounces to the thousand, three-fourths of 1 cent [1½ cents] per pound.

163. Needles for knitting or sewing machines, including latch needles, $1 per thousand and 25 per centum ad valorem; crochet needles and tape needles, knitting and all other needles, not specially provided for in this section, and bodkins of metal, 25 per centum ad valorem; [new] but no articles other than the needles which are specifically named in this act shall be dutiable as needles unless having an eye, and fitted and used for carrying a thread. Needle cases or needle books furnished with assortments of needles or combinations of needles and other articles, shall pay duty as entireties according to the component material of chief value therein.

164. Steel plates engraved, stereotype plates, electrotype plates and plates of other materials, engraved or lithographed, for printing, 20 [25] percentum ad valorem. [New.] Plates of iron or steel engraved or fashioned for use in the production of designs, patterns or impressions on glass in the process of manufacturing plate or other glass, 25 percentum ad valorem.

165. [New.] Rivets or studs, lathed, machined or brightened, and rivets or studs for non-skidding automobile tires, 45 percentum ad valorem. Rivets of iron or steel not specially provided for in this section, 1¼ [2] cents per pound.

166. Crosscut saws, 5 [6] cents per linear foot; mill saws, 8 [10] cents per linear foot; pit and drag saws, 6 [8] cents per linear foot; circular saws, 20 [25] percentum ad valorem; steel band saws, finished or further advanced than tempered and polished, 5 [10] cents per pound and 20 percentum ad valorem; hand, back and all other saws, not specially provided for in this section, 25 [30] percentum ad valorem.

167. Screws, commonly called wood screws, made of iron or steel, more than 2 in. in length, 2½ [4] cents per pound; over 1 in. and not more than 2 in. in length, 4 cents per pound; over ½ in. and not more than 1 in. in length, 6 cents per pound; ½ in. and less in length, 8 [12] cents per pound.

168. Umbrella and parasol ribs and stretchers, composed in chief value of iron, steel or other metal, in frames or otherwise, 35 [50] per centum ad valorem [new]; tubes for umbrellas, wholly or partially finished, 35 per centum ad valorem.

169. Wheels for railroad purposes, or parts thereof, made of iron or steel, and steel tired wheels for railroad purposes, whether wholly or partly finished, and iron or steel locomotive, car or other railroad tires or parts thereof, wholly or partly manufactured, 1¼ [1½] cents per pound; ingots, cogged ingots, blooms or blanks for the same, without regard to the degree of manufacture, 1 cent [1¼ cents] per pound; *provided*, that when wheels for railroad purposes or parts thereof, of iron or steel, are imported with iron or steel axles fitted in them, the wheels and axles together shall be dutiable at the same rate as provided for the wheels when imported separately.

170. Aluminum and alloys of any kind in which aluminum is the component material of chief value, in crude form, 7 [8] cents per pound; in plates, sheets, bars, and rods, 11 [13] cents per pound.

171. Antimony, as regulus or metal, three-fourths of 1 per cent per pound.

172. Argentine, albata or German silver, unmanufactured, 25 percentum ad valorem.

173. Bronze powder, brocades, flitters, and metallics, 12 cents per pound; bronze or Dutch metal or aluminum, in leaf, 6 cents per 100 leaves.

174. Copper, in rolled plates, called braziers' copper, sheets, rods, pipes, and copper bottoms, 2½ cents per pound; sheathing or yellow metal, of which copper is the component material of chief value, and not composed wholly or in part of iron ungalvanized, 2 cents per pound.

175. Gold leaf, 35 cents per 100 leaves. The foregoing rate applies to leaf not exceeding in size the equivalent of 3⅜ x 3⅜ in. Additional duties in the same proportion shall be assessed on leaf exceeding in size said equivalent.

176. Silver leaf, 10 cents per 100 leaves [75 cents per 500 leaves].

177. Tinsel wire, lame or lahn, made wholly or in chief value of gold, silver, or other metal, 10 [5] cents per pound; bullions and metal threads, made wholly or in chief value of tinsel wire, lame or lahn, 10 [5] cents per pound and 30 [35] percentum ad valorem; fabrics, laces, embroideries, braids, galloons, trimmings, ribbons, beltings, ornaments, or other articles, made wholly or in chief value of tinsel wire, lame or lahn, bullions, or metal threads, 60 percentum ad valorem.

178. Hooks and eyes, metallic, whether loose, carded, or otherwise, including weight of cards, cartons and immediate wrappings and labels, 4 [5½] cents per pound and 15 percentum ad valorem.

179. Lead dross, including all dross containing lead, lead bullion or base bullion, lead in pigs or bars, old refuse lead run into blocks or bars, and old scrap lead fit only to be remanufactured, lead in any form not specially provided for in sections 1 or 2 of this act, and the lead contents contained in lead-bearing ores of all kinds; all the foregoing, 1½ [2⅛] cents per pound [New]; *Provided*, that on all importations of lead-bearing ores the duties shall be estimated at the port of entry, and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise; on the arrival of the ores at such establishments they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishments, and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample and report the result to the proper custom officers, and the import entries shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law, and the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph.

180. Lead in sheets, pipe, shot, glaziers' lead and lead wire, 1⅜ [2½] cents per pound.

181. Metallic mineral substances in a crude state and metals unwrought, whether capable of being wrought or not, not specially provided for in sections one or two of this act, 20 percentum ad valorem; monazite sand and thorite, 4 [6] cents per pound.

182. [New.] Chrome or chromium metal, ferromanganese, ferrochrome or ferrochromium, ferromolybdenum, ferrophosphate, ferrotitanium, ferrotungsten, ferrosilicon, ferrovanadium, manganese metal molybdenum, titanium, tantalum, tungsten or wolfram metal, 15 percentum ad valorem. [Present duties are $4 per ton on most of these articles.]

183. Nickel, nickel oxide, alloy of any kind in which nickel is a component material of chief value, in pigs, ingots, bars, rods, plates, sheets and strips cut from sheets, but not rolled or drawn, 6 cents per pound.

184. Pens, metallic, except gold pens, 12 cents per gross; with nib and barrel in one piece, 15 cents per gross.

185. Penholder tips, penholders or parts thereof, and gold pens, 25 percentum ad valorem; [new] fountain pens, stylographic pens, and ink pencils or parts of any of them, 30 percentum ad valorem; *Provided*, that pens and penholders shall continue to be classified separately for duty purposes, but so-called combination penholders, comprising besides a penholder a pencil, rubber eraser, automatic stamp, or similar attachments, shall be assessed for duty as entireties according to the component material of chief value therein.

186. Pins with solid heads, without ornamentation, including hair, safety, hat, bonnet and shawl pins; any of the foregoing composed wholly of brass, copper, iron, steel or other base metal, not plated, and not commonly known as jewelry, 35 percentum ad valorem; and agraffes, barettes, bars, belts, buckles, cabochons, chatelaines, clasps, combs, coulants, girdles, slides, dress, hat and millinery ornaments, composed wholly of brass, copper, iron, steel or other base metal, not plated nor polished, nor commonly known as jewelry, 40 percentum ad valorem; if plated, and not jewelry, 40 percentum ad valorem; if any of the foregoing have fancy metal or enameled metal heads or plain heads of glass, paste, wax or any other material than precious or semi-precious stones, 45 percentum ad valorem; if the heads be in imitation or baroque pearls or be ornamented, decorated, cut or ground, 45 percentum ad valorem; if imitation precious stones or imitation pearls or corals, or set in the heads of the pins, or the articles are otherwise mounted or set with imitation precious stones or imitation pearls or corals, 50 percentum ad valorem; any of the foregoing articles, if made wholly or in part of precious metal or if set with precious or semi-precious stones or pearls or corals, shall be classified as jewelry.

187. Quicksilver, 7 cents per pound. The flasks, or bottles, or other vessels in which quicksilver is imported shall be subject to the same rate of duty as they would be subjected to if imported empty.

188. Type metal, 1½ cents per pound on the lead contained therein; new types, 25 percentum ad valorem.

189. Watch movements, whether imported in cases or not, if having not more than seven jewels, 70 [35] cents each; if having more than seven jewels and not more than 11 jewels, $1.35 [50 cents] each; if having more than 11 jewels and not more than 15 jewels, $1.85 [75 cents] each; if having more than 15 jewels and not more than 17 jewels, $1.25 each, and 25 per centum ad valorem; if having more than 17 jewels, $3 each and 25 per centum ad valorem; watch cases and parts of watches, including watch dials, chronometers, box or ship, and parts thereof, clocks and parts thereof, not otherwise provided for in this section, whether separately packed or otherwise, not composed wholly or in part of china, porcelain, parian, bisque or earthen ware, 40 per centum ad valorem; all jewels for use in the manufacture of watches or clocks, 10 per centum ad valorem; *provided*, that all watch movements and cases of foreign manufacture shall have name of the manufacturer and of the city, town, or village, and country of manufacture cut, engraved or die sunk conspicuously and indelibly on the plate of the movement and the inside of the case, respectively, and the movements shall also have marked thereon by one of the methods indicated the number of jewels and adjustments, said number to be expressed both in words and in Arabic numbers, and none of the aforesaid articles shall be delivered to the importer unless marked in exact conformity to this direction.

MISCELLANEOUS METALS AND MANUFACTURES OF.

190. Zinc ore and calamine, 1 cent per pound on the zinc content contained therein; *Provided*, that on all importations of zinc bearing ores the duties shall be estimated at the port of entry, and a bond given in double the amount of such estimated duties for the transportation of the ores by common carriers bonded for the transportation of appraised or unappraised merchandise to properly equipped sampling or smelting establishments, whether designated as bonded warehouses or otherwise; on the arrival of the ores at such establishments they shall be sampled according to commercial methods under the supervision of Government officers, who shall be stationed at such establishments, and who shall submit the samples thus obtained to a Government assayer, designated by the Secretary of the Treasury, who shall make a proper assay of the sample, and report the result to the proper custom officers, and the imported entries shall be liquidated thereon, except in case of ores that shall be removed to a bonded warehouse to be refined for exportation as provided by law; and the Secretary of the Treasury is authorized to make all necessary regulations to enforce the provisions of this paragraph.

191. Zinc in blocks or pigs, 1 cent [1½ cents] per pound; in sheets, 1¼ [2] cents per pound; [new] in sheets coated or plated with nickel or other metal or solutions, 1½ cents per pound; [old] old and worn out, fit only to be remanufactured, 1 cent per pound.

192. [New.] Alloys and other mixed metals in lumps, pigs, blocks, bars, cakes, sheets, or powder, not specially provided for, 20 percentum ad valorem.

193. [New.] Bottle caps, if not colored or embossed in color, 45 percentum ad valorem; if lacquered, enameled, lithographed, or embossed in color, 55 percentum ad valorem.

194. [New.] Cash registers, electrical apparatus and machinery, jute manufacturing machinery, linotype and all typesetting machines, machine tools, printing presses, sewing machines, typewriters, and all steam engines, 30 [45] percentum ad valorem; embroidery machines and lace making machines, 45 percentum ad valorem; *provided*, that all embroidery machines and lace making machines imported prior to July 1, 1911, shall be admitted free of duty.

195. Articles or wares not specially provided for in sections 1 or 2 of this act, composed wholly or in part of iron, steel, lead, copper, nickel, pewter, zinc, gold, silver, platinum, aluminum, or other metal, and whether partly or wholly manufactured, 45 percentum ad valorem.

Maximum and Minimum Feature.

A maximum and minimum feature is incorporated in the bill by the introduction of a special section which, in the case of metal products imported from countries which do not grant their minimum tariff to American goods, levies a retaliatory additional duty of 20 per cent., except as to paragraphs 116, 162, 165, 166, 167, 169 and 178, upon which the retaliatory rates shall be the rates of the Dingley act.

front of which a metal shield slightly smaller than the letter itself is fastened, permitting light to emit through the tissues, an advantage in signs where small letters or figures are used, as they can be read clearly at a greater distance than the ordinary signs without this addition.

The J. R. Dawson Mfg. Company, Philadelphia, Pa., manufacturer of household and office wire goods, has purchased a factory building at 3646-3648 North Lawrence street, on which improvements will be made to afford facilities for handling its growing trade. The company expects to move into its new property about the middle of April.

Miscellaneous.

The Grand Rapids Brass Company, Grand Rapids, Mich., has increased its capital from $200,000 to $250,000 in order to provide additional working capital for the proper handling of its expanding business.

The Standard Pattern & Mfg. Company, Richmond, Ind., has increased its capital stock $20,000. Wm. H. Woolley is president.

The Knight Pneumatic Sander Company has been organized at Huntington, Ind., to manufacture a pneumatic sander for railroad service. Charles E. Knight is at the head of the company.

Gustav Raetz will erect on First avenue, Milwaukee, a two-story brick carriage factory, 66 x 71 ft.

The Petroleum Iron Works Company, Sharon, Pa., has recently contracted for considerable important work. This includes three 10,000-bbl. tanks for the Mexican Oil Company, Tampico, Mexico; four large storage tanks, Western Steel Plate Construction Company, Fresno, Cal.; 55,000-bbl. tank, Oklahoma Oil Company, in the Kiefer field near Tulsa, and several 37,000 and 55,000 bbl. tanks for Nowata, Okla., which lies north of Tulsa; one 50,000-bbl. and four 10,000-bbl. tanks for an Eastern oil company; large storage tanks for Philadelphia and New York producers; one 25,000-bbl. oil storage tank, Hawaiian Sugar Company, Crockett, Cal.; one 5000-bbl. station tank, Union Oil Company, Astoria, Ore., and for the Western Steel Plate Construction Company, San Francisco, Cal., five 75,000-gal. oil storage tanks, which are erected on steel trestles 24 ft. high and fitted with pipes for supplying locomotives using fuel oil. Railroads using fuel oil include the Southern Pacific, Salt Lake System, Santa Fé and others. The Petroleum Oil Works Company also manufactures Gem fuel oil burners, and reports business to be very good in that department.

Edward G. Mueller, W. L. McKay and A. L. Petty of Pittsburgh have applied for a charter for the Pittsburgh Reinforced Brazing & Machine Company to manufacture, weld and braze iron, steel and all other metals.

The Aluminum Goods Mfg. Company has been organized with a capital stock of $750,000 by G. A. Kruttschnitt of the New Jersey Aluminum Company, Newark, N. J., and others, to manufacture aluminum novelties and castings. It is the intention to operate several plants in various parts of the country, particularly in the West. It is understood that the company will take over the Manitowoc Aluminum Novelty Company, Two Rivers Aluminum Company and the New Jersey Aluminum Company.

H. M. Parker, New Brunswick, N. J., is to erect a three-story garage, 52 x 62 ft.

In the recent note in these columns concerning the contemplated removal of the plant of the Hancock Mfg. Company, it was erroneously stated that the company is located at Marshall, Mich. The company, which is located at Charlotte, Mich., has not yet selected a location for its new plant and is open for propositions from various cities.

Cortlandt F. Bishop, president of the Aero Club of America, New York; A. M. Herring and Glenn H. Curtiss have organized a company to make aeroplanes under the designs of A. M. Herring and Glenn H. Curtiss. The machines will be built at the motor plant of Mr. Curtiss at Hammondsport, N. Y.

Thomas B. Jeffery & Co., Kenosha, Wis., makers of the Rambler automobile, intend to enlarge their plant by the erection of four new buildings, one of which will be over 300 ft. square. This building will be devoted to the inspection and finishing of cars.

The American Thermostat Company has been incorporated at Elmira, N. Y., with a capital stock of $25,000 to manufacture thermostats and electrical devices, by Burchard C. Johnson, Arthur McClellan and Byron R. Johnson.

The Connellsville Iron Works, New Haven, Pa., has increased its capital stock from $10,000 to $50,000, the additional capital to be used in enlarging its capacity and extending its business. The company intends to enlarge its shops, trebling the capacity. It is equipping its works for the building of steel cars in larger quantities and on a more economic basis in order to place its products on the market at prices that will be within the reach of small as well as the large operators. In addition to the making and repairing of boilers, the company manufactures larries, chutes, steel mine cars, steel dump wagons, tanks, &c.

The Welland Stove Works, Ltd., Welland, Ontario, is to erect a two-story building, 48 x 140 ft., of brick and steel with cement foundations.

At the Engineering Exhibit being held this week at the Coliseum in Chicago, the G. Drouve Company, Bridgeport, Conn., is showing its Anti-Pluvius puttyless skylight and the Lovell window operator in space No. 83. The Anti-Pluvius puttyless skylight has been furnished for a number of the well-known buildings that have recently been built or are now building—namely, the Fifth Avenue Office Building, Central Railroad of New Jersey ferry terminal, New York; Chicago City Railroad carhouses, Lackawanna Railroad's new terminal at Scranton, Pa.; Blake & Johnson Company's new plant at Waterbury, Conn., &c. The Lovell window operator has been specified and used in connection with extensions and improvements made to plants in various parts of the country. The company will be represented by members of its staff from Bridgeport and Chicago offices.

The Seneca Pattern & Supply Company, Seneca Falls, N. Y., whose plant was recently destroyed by fire, has closed arrangements for a factory building on Powers alley, Geneva, N. Y., which was formerly occupied by the Hayes Track Appliance Company, and will move its plant to Geneva. The company manufactures patterns for foundries who do not make their own patterns. J. D. Boardman is president.

The South Bend Iron Works, South Bend, Ind., the holding company for the Oliver Chilled Plow Company, has announced its intention of building an addition to the Rochester, N. Y., plant, which is located on Jones street. The addition is to be two stories, 50 x 200 ft., of brick and concrete construction, and will be used for storage and assembling.

The Genesee Metal Company, Rochester, N. Y., has been incorporated with a capital of $100,000, all of which has been paid in. The organizers of the company are E. C. Hazard, 49 Phelps avenue; George R. Coates, 333 Frank street, and F. W. Reidenbach.

The business of the Bliss Electric Car Lighting Company, Milwaukee, has picked up materially of late, indicating an increasing demand for passenger car equipments.

The Standard Bronze Company, 141 Broadway, New York, has leased a three-story factory building at 20 Eckford street, Greenpoint, Brooklyn, which contains about 25,000 sq. ft. of floor space, for manufacturing purposes. It is understood that the company will take over the power equipment installed in the building.

The Black Fox Brick Company, Pittsburgh, has placed a contract for the construction of a new dry house at its plant at Monterey, Clarion County, Pa. The addition will be of the tunnel system style and with other improvements being made will about double the present capacity of the plant. The contract includes 35 cars, tracks and turntables. The company manufactures a high grade silicon brick.

The 20 new ovens of the Marion Coke Company, owned by H. A. Davis, are being dried out this week preparatory to being placed on the active list. The new plant is located on the Sewickley branch of the Pennsylvania Railroad, near Udell.

The American Flake Graphite Company, Inc., is starting up its new and strictly modern refining mill, with a daily product of 4 to 5 tons. This company is officered by J. Warren May, president, formerly with the Joseph Dixon Crucible Company, Jersey City, N. J., and the U. S. Graphite Company, Saginaw, Mich.; J. W. Lattig, treasurer, inventor of the direct telephone system of talking direct to any subscriber, thus avoiding the delay caused by first calling up the central office; J. W. Wright, secretary, of extensive experience. The stockholders are among the most substantial business men of South Bethlehem, Pa., and nearby localities. The mine is pronounced to be one of the best in the Chester Valley. In addition to President May's practical experience, the company is fortunate in having for superintendent Robert J. Rader. The veteran iron and steel merchants, Charles Hubbard & Co., Market & Fulton Bank Building, 81 Fulton street, New York City, are selling agents.

Reeves Brothers, Alliance, Ohio, recently shipped three 5500-bbl. tanks to J. E. Crosbie, who is operating in the Glen oil fields, Tesla, Kan.

The economy and efficiency of the Kirkwood natural gas burners, manufactured by Tate, Jones & Co., Inc., Pittsburgh, Pa., were recently shown by the placing of a contract for a large number of them to be installed in the works of the Chanute Cement & Clay Products Company, Chanute, Kan. These burners having proved efficient in a large number of actual working tests in cement and other plants, were specified for this modern plant. By the use of these high efficiency burners a large saving in fuel and operating expenses has been made possible.

The Union Wheel & Mfg. Company, Coxsackie, N. Y., recently incorporated, has secured a building in which it will move the equipment formerly used by the Standard Polishing Wheel Company, Springfield, Mass., whose business it purchased a short time ago. The company will not be in the market for additional machinery for two or three months. It will manufacture polishing, emery and corundum wheels, grinding machinery and supplies. W. C. Van Alstyne is president; F. H. Sutherland, vice-president; W. R. Church, secretary, and M. C. Richtmyer, treasurer.

The Union Gaslight & Fuel Company, Anderson, Ind., has contracted with E. C Cowdery of Chicago for plans and specifications for a gas plant at Anderson, to cost $125,000.

The Iron and Metal Trades

Fair Activity in Structural Steel.

Pig Iron Markets Weaker.

Copper Demoralized.

Aside from a continued fair measure of activity in structural material, there has been no movement of much consequence in any of the finished lines. During the week there has been placed a contract for 8000 tons of material for the Northern Pacific, 2000 tons for the Great Northern, 6300 tons for the Queen & Crescent bridge over the Kentucky River, 2400 tons for track elevation at Chicago for the Panhandle and 4000 tons for the Jordan-Marsh Building at Boston. It is understood that low prices have been named for structural material and that 1.10c., Pittsburgh, has been done.

There is considerable work pending. The Chicago & Northwestern will need 11,000 tons for track elevation at Chicago, the Reading road will require from 8000 to 10,000 tons for a similar purpose at Philadelphia, the Lake Shore is asking for 8000 tons and the Louisville & Nashville road is figuring on 5000 to 7000 tons.

At Cleveland the contracts were placed for 11,000 tons of plates and shapes for three new lake boats, which the American Shipbuilding Company is to build. There is in the market, too, a lot of 6000 tons of plates for storage tanks for an oil producer.

There are very considerable inquiries for pipe lines, which promise to crowd the works with the larger sizes. Among them is 300 miles of 16-in. pipe for the Oklahoma Natural Gas Company, 60 miles of 16-in. pipe for the Kansas Natural Gas Company and 400 miles of 8-in. pipe for the Pure Oil Company of Illinois.

Chicago mills have closed for about 15,000 tons of steel rails, and there is now in the market an inquiry for 13,000 tons for the Harriman System for delivery at Guaymas, Mexico, in July and August, and 16,000 tons for the Cuba railroad.

The reduction in the price of tin plate to $3.40 per box, Pittsburgh, came rather earlier than expected. It is understood that it was the result of the fact that canners were declining to take the goods contracted for unless a reduction were made. In the wire trade new business is light, as is only natural since it is the general impression in the trade that a considerable reduction in the price will be made later on.

The pig iron markets generally are weaker, and it looks as though a reduction in the active capacity will soon become a necessity. There has been a fair amount of business in foundry irons in New England, where northern New York, Virginia and Alabama furnaces are competing closely, until $16.50, delivered, for No. 2 foundry has been done in at least one conspicuous instance. In some sections of the country stocks are accumulating, and Eastern steel makers notably are holding up shipments, because their plants are running very slowly.

The leading interest was the only bidder on the 45,000-ton cast iron pipe contract for San Francisco. The award has not yet been made. The Cheyenne contract for 20,000 tons will not be decided until April 5.

The copper trade has had another spasm this week, from which it has recovered slightly during the last day. It is authoritatively stated that 12⅛c. was done for electrolytic. It looks like a fight to the finish between the large producing interests, none of whom seem to be disposed to curtail output. The sooner the weaker mines submit to the inevitable closing down the better for all. From the consumers' point of view the metal will need close watching, although 11½c. does not seem further off now than 12c. did six weeks ago.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar.17, 1909.	Mar.10, 1909.	Feb.17, 1909	Mar.18, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	*$16.25*	$16.50	$17.00	$18.25
Foundry No. 2, Southern, Cincinnati	*14.75*	15.25	16.25	15.25
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.85*
Basic, delivered eastern Pa	*15.50*	16.00	16.75	17.25
Basic, Valley furnace	15.00	15.00	15.00	15.50
Bessemer, Pittsburgh	*16.40*	16.40	16.90	17.90
Gray forge, Pittsburgh	*14.40*	14.90	15.15	15.90
Lake Superior charcoal, Chicago	19.50	19.50	19.50	21.50
BILLETS, &c., Per Gross Ton:				
Steel Billets, Pittsburgh	*23.00*	23.00	25.00	28.00
Forging billets, Pittsburgh	*25.00*	....	27.00	30.00
Open hearth billets, Phila	*25.40*	24.20	26.20	30.40
Wire rods, Pittsburgh	33.00	33.00	33.00	35.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*13.00*	13.00	14.50	12.25
Steel rails, melting, Phila	*13.50*	13.50	15.50	12.75
Iron rails, Chicago	*17.25*	17.75	18.25	15.00
Iron rails, Philadelphia	*17.00*	17.00	19.00	17.00
Car wheels, Chicago	*14.75*	14.75	15.25	15.50
Car wheels, Philadelphia	*14.00*	14.00	15.50	14.00
Heavy steel scrap, Pittsburgh	*14.00*	14.25	15.50	13.00
Heavy steel scrap, Chicago	*12.00*	12.50	13.50	11.50
Heavy steel scrap, Philadelphia	*13.50*	13.50	15.50	12.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents	Cents.
Refined iron bars, Philadelphia	*1.37*	1.42	1.47	1.65
Common iron bars, Chicago	*1.40*	1.40	1.50	1.65
Common iron bars, Pittsburgh	*1.40*	1.40	1.50	1.50
Steel bars, tidewater, New York	*1.36*	1.36	1.56	1.76
Steel bars, Pittsburgh	*1.20*	1.20	1.40	1.60
Tank plates, tidewater, New York	*1.46*	1.46	1,76	1.86
Tank plates, Pittsburgh	*1.30*	1.30	1.60	1.70
Beams, tidewater, New York	*1.46*	1.46	1.76	1.86
Beams, Pittsburgh	*1.30*	1.30	1.60	1.70
Angles, tidewater, New York	*1.46*	1.46	1.76	1.86
Angles, Pittsburgh	*1.30*	1.30	1.60	1.70
Skelp, grooved steel, Pittsburgh	*1.25*	...	1.45	1.70
Skelp, sheared steel, Pittsburgh	*1.35*	...	1.50	1.80
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, Black, No. 28, Pittsburgh	*2.20*	2.30	2.50	2.50
Wire nails, Pittsburgh	1.95	1.95	1.95	2.05
Cut nails, Pittsburgh	1.80	1.80	1.75	1.90
Barb wire, galv., Pittsburgh	2.40	2.40	2.40	2.50
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	13.00	13.50	13.00
Electrolytic copper, New York	*12.25*	12.62½	13.12½	12.87½
Spelter, New York	*4.80*	4.80	4.92½	4.80
Spelter, St. Louis	*4.65*	4.65	4.80	4.60
Lead, New York	*4.02½*	3.97½	4.05	4.00
Lead, St. Louis	*3.87½*	3.82½	3.90	3.85
Tin, New York	*28.50*	28.65	28.80	30.50
Antimony, Hallett, New York	*7.75*	7.75	8.00	9.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	*$3.64*	$3.89	$3.89	$3.89

* This quotation has been changed for uniformity from price at furnace to delivered price at foundries, adding 35c. for switching charges.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rate from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steel, and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.30c., net; I-beams over 15 in., 1.40c., net; H-beams over 8 in., 1.50c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.30c., net; angles, over 6 in., 1.40c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.50c., base, half extras, steel bar card; tees, 3 in. and up, 1.30c., net; zees, 3 in. and up, 1.30c., net; angles, channels and tees, under 3 in., 1.20c., base, half extras, steel bar card; deck beams and bulb angles, 1.60c., net; hand rail tees, 2.70c., net; checkered and corrugated plates, 2.70c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.30c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in	.05
For widths over 110 in. up to 115 in	.10
For widths over 115 in. up to 120 in	.15
For widths over 120 in. up to 125 in	.25
For widths over 125 in. up to 130 in	.50
For widths over 130 in	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c., f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipment on sheets in carloads and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c. Box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Galvanized sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.45c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.80c.; No. 27, 3c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.55c. Painted roofing sheets, No. 28, 1.55c. per square. Galvanized roofing sheets, No. 28, 2.80c. per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the general trade, are 80 and 5 per cent. off list, and on iron pipe, ¾ to 6 in., are 77 per cent. off list, while to the largest jobbers one point on the base and 5 per cent. differential additional are allowed. Regular discounts to jobbers in carloads, to which 1 per cent. on the base and 5 per cent. differential are allowed to the large trade, are as follows:

	Steel merchant pipe. Black.	Steel merchant pipe. Galv.	Genuine iron pipe. Black.	Genuine iron pipe. Galv.
	%	%	%	%
⅛ to ¼ in.	72	56	69	53
⅜ in.	73	59	70	56
½ in.	76	64	73	61
¾ to 6 in.	80	70	77	67
7 to 12 in.*	75	60	72	57
Extra strong, plain ends:				
⅛ to ⅜ in.	65	53	62	50
½ to 4 in.	72	60	69	57
4½ to 8 in.	68	56	65	53
Double extra strong, plain ends:				
½ to 8 in.	61	50	58	47

* Iron prices are for 7 to 8 in.

Boiler Tubes.—Regular discounts are as follows:

Boiler Tubes.

	Steel.
1 to 1½ in.	50
1¾ to 2¼ in.	62
2¾ to 5 in.	70
2½ in.	64
6 to 13 in.	62
2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.	
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.	

Wire Rods.—Bessemer rods, $33; chain rods, $33; basic rods, $34.

Chicago.

FISHER BUILDING, March 17, 1909.—(*By Telegraph.*)

Business for the past week in finished steel products aggregated a larger tonnage than in any like period since the prices were reduced. The lines contributing chiefly to this result where plates, structural shapes, steel bars and rails, orders for 11,000 tons of the latter being booked by the leading interest. Close adherence by mills to the requirement of early specifications restricts buying to nearby needs of consumers, which under the present policy of selling are not being covered beyond July 1, except on rails. Values are gradually settling toward an even level, and variations in prices are narrowing down to closer limits. The competition engendered by the open market policy is indeed remarkable rather for its conservatism than otherwise. The greatest drawback now experienced is that of hesitancy on account of the possible effects of tariff changes, and the probable readjustment of wages. Up to the present time wages have not been cut by the Western mills, but unless the drift of affairs is soon reversed labor will likely be called upon to carry its share of the economic burden. Two prospective pipe orders, one of 45,000 tons, at San Francisco, the closure of which is expected this week, and another of 20,000 tons, at Cheyenne, which will come up early next month, will, if placed, strengthen the position of the pipe foundries. Incidentally, it will have a bearing on the Southern pig iron situation, since the tonnage destined for San Francisco seems likely to go to Southern shops.

Pig Iron.—Transactions have been confined to spot demands, which on the whole were exceedingly light. As a matter of fact, the movement in pig iron is too slow and faltering to have a pronounced influence on prices one way or the other. The tendency is downward, and Southern iron is less firmly held. On a few small spot sales made in this territory $12, Birmingham, has been done, and one lot of 250 tons was placed at $12.25, for No. 2 foundry. At the same time a willingness is expressed by sellers to go as low as $11.50 on an offer of fair size, say 1000 tons or more; but this offer would not extend to deliveries beyond the second quarter. The uncertainty of the tariff issue and the present unsettled state of general industrial movements act as a bar to the consideration of second half contracts either by producers or consumers. The attitude of the Northern furnaces remains practically unchanged, there being no business offered that would make it worth while to depart radically from the current schedule. Shipments continue to move with fair regularity, indicating that consumption is not appreciably falling off. In revising prices this week on Southern iron we quote on a basis of $11.50, Birmingham, for No. 2 foundry. The following quotations are for March delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.00 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.35 to 15.85
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	14.35 to 14.85
Southern mottled	14.10 to 14.60
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.90 to 18.40
Jackson Co. and Kentucky silvery, 6 %.	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %.	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %.	22.90 to 23.40

(*By Mail.*)

Billets and Rods.—Beyond a few scattering sales of small lots of forging billets no business is reported, nor are there any inquiries from any source that are significant of nearby requirements. While $23, Pittsburgh, is accepted as the ruling market figure for rolling billets, it is evident that where considerable tonnage is involved it is likely to be considered individually and priced accordingly. There has been nothing in recent transactions, however, to test the market seriously, which is nominally governed by the Pittsburgh price. There is but little movement in wire rods, the price of which remains unchanged, although some deviation from the regular quotations is encountered where competition with iron bars is a factor.

Rails and Track Supplies.—Orders amounting to 11,000 tons of standard rails have been entered by the leading interest since last report. This was made up of several small lots, the largest of which amounted to 4000 tons and included 2500 tons for the Monon, 2000 tons for a small Texas road, the requirements of the Manistee & Great Northern and other Western lines. The demand for light rails has fallen off considerably. Prices in this market are fairly steady at $24 for 25 lb. to 45 lb. sections.

Structural Material.—Few fabricating contracts have been placed during the week, the leading transactions being orders for 8000 tons for the Northern Pacific and 2000 tons for the Great Northern Railway, which were taken by the American Bridge Company; this interest also secured 600 tons from the Chicago City Railways Company. It is expected that the 11,000 tons required by the Chicago & Northwestern for track elevation work will be placed in a few days. Specifications on railroad contracts are being furnished freely, and inquiries for small lots of bridge material for immediate shipment are more numerous. A contract for 500 tons for the construction of the First National Bank Building, Fort Worth, will probably be let within a day or two. The general disposition of buyers having building projects in hand is to hurry them forward to take advantage of the low fabricating prices now being made. Proposals for forward contracts at present prices are not being entertained by the shops, which insist upon delivery within three months at the furthest. Mills are now better supplied with specifications and are running fuller than for some time.

Plates.—Business in plates begins to show considerable improvement. The principal buying comes from the structural shops, yet the proportion of sheared plates is considerably increased. Supplementing the miscellaneous orders from boiler and tank shops, specifications from jobbers have been coming out more liberally. The market seems to hold fairly even at 1.30c., Pittsburgh, which is recognized as the ruling quotation. Business consists principally of current

orders and thus far the question of contracts covering future requirements is not being considered either by buyers or sellers.

Sheets.—Trade in sheets shows a better response to the inducement of lower prices than some other lines. Business is gradually gaining, although buyers are still ordering conservatively. Prices have not as yet settled to a conclusive level. While current quotations apply with fair regularity to ordinary business, they are being shaded in competition for desirable orders. The local sheet mill is running nearly full.

Bars.—A comparison made between the first two weeks in February as against the same period in March by an independent interest shows a slight gain in the total of tonnage in new business and specifications in favor of the present month. A better gain is also reported by the leading interest. Specifications against contracts are not as yet being entered, though buyers are beginning to manifest a good deal of interest in the question of season contracts. As soon as the mills are willing to begin the entry of such business it is likely that a large tonnage will be closed within a short time. The price of steel bars has settled to a basis of 1.35c., Chicago, which is fairly well maintained. Trade in iron bars is not as active as it was prior to the cut. Orders generally include only such amounts as are required for present use. While 1.40c. is the price nominally asked, this is being shaded at least $1 a ton.

Merchant Pipe.—Last week's business gives evidence of a better demand for pipe, which, however, is only moderate. The favorable outlook for new building construction lends encouragement to the hope of a decidedly more active market in the near future. It is certain that the movement has not been appreciably quickened by the recent reduction of prices. The new prices are being fairly well maintained.

Boiler Tubes.—The market is extremely quiet, with little new business developing. Prices on steel tubes are being shaded from 2½ to 5 per cent. from the regular quotation of 70 per cent., Pittsburgh.

Merchant Steel.—Shafting prices have been reduced from 57 per cent. off in carload lots, and 52 per cent. in less than carload lots, delivered, in base territory to 65 per cent. and 60 per cent., respectively. This reduction amounts, on base sizes listed at 5c. per pound to $2 a ton. The demand for merchant steel and miscellaneous shapes from implement makers is fairly satisfactory; in fact, the shipments of one prominent mill interest for February exceeded in tonnage those of any previous month.

Old Material.—There is not enough doing to establish a reliable level of prices, but evidences of weakness are unmistakably apparent. Nothing but small lots are being offered from any source. Even if there was a demand sufficient to enable dealers to unload their holdings, they could not do so at the present time without serious loss. The majority of the small list offered by the Atchison did not reach this market, but was disposed of in the West. One car of No. 1 wrought brought $11.60, delivered at consumer's works. The Illinois Central sold a few hundred tons of odds and ends. It is claimed that a number of the roads have a large accumulation of material, that of one line being estimated at between 30,000 and 35,000 tons. Another small list, amounting in all to 14 cars, on track, is being offered by the Atchison for closure this week. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails	$17.25 to $18.25
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	22.50 to 23.50
Old car wheels	14.75 to 15.25
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.50 to 13.00
Mixed steel	10.75 to 12.25

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	17.50 to 18.00
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	9.00 to 9.50
Mixed busheling	7.00 to 7.50
Iron axle turnings	7.00 to 7.50
Soft steel axle turnings	6.50 to 7.00
Machine shop turnings	6.50 to 7.00
Cast borings	5.25 to 5.50
Mixed borings, &c.	5.25 to 5.50
No. 1 mill	7.00 to 7.50
No. 2 mill	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	12.25 to 12.75
Stove plate and light cast scrap	11.25 to 11.75
Railroad malleable	11.00 to 11.50
Agricultural malleable	9.75 to 10.25
Pipes and flues	8.50 to 9.00

Cast Iron Pipe.—The letting of 20,000 tons, for which the city of Cheyenne was in the market, has been postponed until April 5. Bids on 300 tons were opened a day or two ago by Bay City, Mich. The city of Toledo expects to come into the market soon for a lot of pipe amounting probably to 1000 tons. Prices are nominally unchanged, and we quote per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16 in. and up, $25, with $1 extra for gas pipe.

Metals.—Copper is slightly weaker, with very little demand. Sales are scattering and comprise only small lots. The heavy holders of copper are not pressing for business. There is no material change in prices of other materials, the market throughout being extremely quiet. Quotations are as follows: Casting copper, 13c. to 13¼c.; lake, 13½c. to 14c., in car lots, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 30½c.; small lots, 34½c.; lead, desilverized, 3.95c. to 4.05c., for 50-ton lots; corroding, 4.20c. to 4.30c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; spelter, 4.90c. to 5c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¼c.; sheet zinc is $6.75, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13c.; copper bottoms, 11¼c.; copper clips, 11c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 7c.; lead pipe, 3.75c.; zinc, 2½c.; pewter, No. 1, 21c.; tin foil, 23c.; block tin pipe, 26c.

Philadelphia.

PHILADELPHIA, PA., March 16, 1909.

The whole trade is waiting for tariff revision, and business in almost every line, except that of an urgent nature and for small current requirements, has been held up until something is learned in reference to the expected reductions in duties. While the matter of wage reductions has, for the same reason, been held in abeyance by a number of concerns, the Pennsylvania Steel Company and the Maryland Steel Company announce to-day a reduction of 10 per cent., effective April 1. Several additional rolling mills have reduced puddling wages from $4.50, the old basis, to $3.75 a ton, to which there seems to have been little opposition on the part of the men. In some cases where a reduction of a full dollar a ton was made puddlers show a disposition not to accept the new rate. The trade is hopeful regarding the future, and it is believed that business will rapidly readjust itself after something definite regarding the tariff is known.

Pig Iron.—Buyers still show practically no interest in the market, their earlier purchases being sufficient to carry them along, and when purchases are made they usually cover only small lots to piece out. Inquiries for near future requirements are light, although there has been some feeling around in foundry grades for deliveries for the third quarter and last half, but there is no disposition to place orders, and most sellers refuse to quote for forward delivery. Some melters are not taking deliveries on contract iron as freely as they were, this being particularly noticeable on the part of the steel mills, which are not melting as heavy tonnages as they were some weeks ago. Under the circumstances it is difficult to make quotations, and figures named represent small transactions on which buyers take their usual grades and brands, the tonnages not being sufficiently large to warrant shopping around. Standard No. 2 X foundry has been sold down to $16.40, delivered, and sellers in some cases express a willingness to accept $16.25 for any reasonable tonnage. In the absence of any business of importance others maintain $16.75 for small spot lots of that grade. Virginia irons have been somewhat more active, although sales for delivery in this territory have been practically nil; 3000 tons of No. 2 X foundry, shipment at seller's option, were sold for New England delivery at $13.50, furnace, while smaller quantities were sold at $13.75, furnace. A sale of 2500 tons of Virginia pipe iron, for nearby delivery, was also reported at $13.25, furnace, shipments extending through three months. Forge iron is in light demand, and prices show a softening tendency, several sellers expressing a willingness to accept 25c. under last week's quotations. There is no demand for the steel making grades; no difficulty would be experienced in shading recent basic quotations 50c. a ton. It will require more active transactions than have recently prevailed to fix prices firmly. The following range fairly represents prices for standard grades, delivery in buyers' yards, eastern Pennsylvania and nearby territory, during the second quarter:

Eastern Pennsylvania, No. 2 X foundry	$16.25 to $16.75
Eastern Pennsylvania, No. 2 plain	15.75 to 16.25
Virginia, No. 2 X foundry	16.75 to 17.00
Virginia, No. 2 plain	16.25 to 16.75
Gray forge	15.25 to 15.50
Basic	15.50 to 15.75
Low phosphorus	21.50

Ferromanganese.—There is no demand and quotations are entirely nominal, at $42, Baltimore. A firm inquiry would, no doubt, bring out a lower figure.

Billets.—Transactions have been light, confined to small spot sales. There has been some inquiry from fairly large buyers, merely to test the market, but in the absence of a disposition to place orders sellers refuse to name anything below $23, Pittsburgh, with full freight, or $25.40, delivered in this territory, for ordinary rolling billets. The usual advance of $2 a ton is named for forging billets, the usual extras applying.

Plates.—Buyers are covering immediate needs only, and mills in this territory are booking but a moderate amount of business. While there have been a few inquiries for extended delivery, sellers refuse to quote on contracts to run beyond July 1. There has been no apparent further recession in prices, and small lots are being taken at 1.55c., delivered in this territory. On moderate quantities for early delivery, however, 1.45c. is freely quoted, the usual extras applying.

Structural Material.—While there is considerable business pending, no large propositions have been closed. The requirements of the Philadelphia & Reading Railroad, covering some 8000 to 10,000 tons, for its elevated structure in this city, are expected to be ready for letting in the near future. The bulk of the business placed during the week has been of a miscellaneous character, but aggregates on the whole a fair tonnage. Prices for plain material are unchanged, ranging from 1.45c. to 1.55c., delivered in this territory, according to specification.

Sheets.—Business has been very light, and mills, while operating at reduced capacities, are understood to be accumulating stock. There is no forward business, current orders being almost entirely for small spot lots, for which quotations for delivery in this territory range as follows: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

Bars.—Buyers are apparently waiting until wage adjustments have been concluded, further announcements regarding which have been made during the week. Prices show quite a wide range, refined iron bars being quoted from 1.37c. to 1.47c., delivered in this territory, the lower figure applying to mills making a limited run of sizes. Some little business has been done in steel bars at the recently established basis, equal to 1.35c. delivered in this vicinity.

Coke.—Business is irregular, sales being confined to small tonnages for near future shipment. Prices are fairly well maintained on standard grades, but stock coke for prompt shipment is offered at a concession. For delivery in this territory the following range of prices, dependent upon grade, is quote:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.25 to 4.50
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.85 to 4.10

Old Material.—Buyers and sellers do not seem to be as wide apart in their ideas regarding prices, and some mills show a little more disposition to take in scrap at the present range, which for some grades is somewhat lower than last quoted. Sales have not been large, but there is more business moving and the market on the whole is less uncertain. While quotations are still largely nominal, the following represent about what can be done for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$13.50 to $14.00
Low phosphorus	17.00 to 18.00
Old steel axles	17.00 to 17.50
Old iron axles	18.00 to 19.00
Old iron rails	17.00 to 17.50
Old car wheels	14.00 to 15.00
Choice No. 1 R. R. wrought	15.00 to 15.50
Machinery cast	14.00 to 14.50
Railroad malleable	12.50 to 13.00
Wrought iron pipe	13.25 to 13.75
No. 1 forge fire scrap	12.00 to 12.50
No. 2 light iron	7.00 to 8.00
Wrought turnings	10.00 to 10.50
Stove plate	11.00 to 11.50
Cast borings	8.00 to 8.50
Grate bars	12.00 to 12.50

San Francisco.

SAN FRANCISCO, CAL., March 10, 1909.

The disturbance caused by the reduction in prices of rolled products has quieted down somewhat, and while buyers in this market still feel some uncertainty regarding future developments, values at present seem to be faily well established. Up to the present time the reduction has brought no perceptible increase in the buying movement. Some orders are being placed to fill current requirements, but the local jobbers are not disposed to increase their stocks until such action is made necessary by a larger demand, anticipating a definite establishment of prices in the meantime. There are some indications, however, that buying will be more general from now on. With an unusually good agricultural outlook and a general revival of Pacific Coast industries the demand is expected to be considerably in excess of that of last spring, and the jobbing movement already shows some increase. While little business is coming from the oil fields at present, there is a fair inquiry for merchant pipe in the interior and an increased movement is anticipated as soon as the roads are in good condition. Prices are fairly well established on steel bars for reinforced concrete work and a steady movement is taking place in view of immediate requirements. While the present demand for light rails is limited, more inquiry is expected during the summer, and moderate inquiries for standard rails have been received from some of the logging interests.

Structural Material.—With the contracts for the Y. M. C. A. Building, the Scottish Rite Cathedral, the Hobart Estate and Phœnix Realty buildings, besides a large tonnage for local harbor work and numerous smaller jobs, Dyer Bros. of this city have work on hand to keep them occupied for the next month or two. Plans have been approved for Pier 36, and the steel contract for Pier 34, requiring Bethlehem shapes, will be awarded as soon as the money is available, the pier being leased in advance to the Western Pacific. Contracts recently taken by the Pacific Rolling Mill Company include a post office at Santa Rosa, Cal.; a Carnegie Library at Lincoln, Cal.; several small buildings in Los Angeles and San Jose, and 12 tank supports for the Western Pacific, requiring about 60 carloads of material. Brode & Clark have taken a small contract for a building at Howard and Second streets. The total tonnage moving in the city at present is considerably larger than a month ago, including many small buildings which are of no individual importance. There is no further delay on account of the change in values, but it is noted that local contractors are still getting a large proportion of the work. A moderate quantity of structural shapes is now arriving from foreign ports. Contracts on the Kohler & Chase Building and the Prager department store are still in prospect. No award has been made on the Hall of Justice, but figures are now being taken. A six-story steel frame building is to be erected this spring for the Native Sons' Hall. Wakelee & Co. are planning a seven-story building at Powell and Ellis streets. The Mechanics' Institute, requiring about 800 tons, will come up in a few days. The management of the St. Francis Hotel announces that work on the new wing will be commenced in the near future. The Portland Railway, Light & Power Company, Portland, Ore., is planning a nine-story steel building. An eight-story structure is soon to be erected for the First National Bank of San Jose. Plans have been completed for the steel work for the chapel at Stanford University. The capacity of local fabricators for structural work is now about 10 times what it was before the fire, all the shops being well equipped; notwithstanding the large proportion of work taken by them of late, few are working up to their capacity. The outlook for work during the summer is improving, as a number of important structures will probably come up for figuring during the next month or two. Money for building purposes is now fairly plentiful, and lower rates of interest, combined with the reduction in price of structural steel, is bringing out many new projects of moderate size.

Pig Iron.—Notwithstanding the increasing amount of foundry work in this city only a few of the larger melters are working at anything like their capacity, and as they are carrying large stocks there is little movement in the market. The arrivals of late have been larger than for some time, the latest being 100 tons of Chinese iron for this port and 1000 tons for San Pedro. As the arrivals are considerably in excess of current requirements of receivers, who have additional tonnage to arrive later in the year, they show some anxiety to make sales for immediate delivery and are making extremely low prices on such business. While a few of the melters are making occasional purchases, they show no disposition so far to anticipate their requirements, taking on only enough to fill immediate needs. While it is impossible to forecast conditions for the coming summer with any accuracy, a considerable tonnage of castings will probably be required by the city in connection with the fire protection system, and this, in addition to the increasing demand for structural cast iron work, is counted upon to reduce stocks of pig iron to about a normal condition. Large offers are being made of Continental pig iron to arrive and some large sales have been made at about $22. No. 1 Hang Yang iron is quoted at $22.75 and gray forge iron is offered on the spot at $20.

Cast Iron Pipe.—Aside from the San Francisco fire protection system, bids for which have just been opened, there has been little inquiry for several weeks and at the moment only a few scattered carloads are moving. An effort was made on behalf of Belgian manufacturers to have the opening of the bids postponed for three weeks. The city engineer has received from Secretary Garfield and Secretary Wilson the final grants of canal rights of way, &c., for the proposed Hetch Hetchy water system and plans are now being made for preliminary work in preparing the reservoir sites, but nothing new has developed regarding the distributing system. The Eureka Water Works Company, Eureka, Cal., expects to spend about $70,000 this year in improvements, and additions are being made to the system of the neighboring town of Arcata. A salt water system is being installed at Petaluma, Cal. Bids are being taken by the city of Aberdeen, Wash., for 1800 ft. of 8-in. pipe. The Washington Pipe and Foundry Company, Tacoma, has taken a small contract for Wilson Creek, Wash. This company is planning a large addition to its plant. Only one bid was received for the cast iron pipe to be used in the new fire protection system, the bidder being the United States Cast Iron Pipe & Foundry Company. The price, f.o.b. point of shipment, was $19.90 per net ton for bell and spigot pipe; on dock at ports

named in the specifications, $21, and delivered in San Francisco, $33. The contract was not awarded, as the Board of Public Works wishes to make a more complete examination of the bid. While there is a possibility that new proposals may be called for, owing to the lack of competition, it is more likely that the award will be made by the end of the week.

Merchant Pipe.—The local jobbing trade is still quiet and so far few deliveries are being made in the interior, though inquiries from the northern part of the State are increasing. While many inquiries are being received from the oil districts and the requirements there for the next few months are expected to be large, few transactions of any importance have been closed. Notwithstanding the lower price, jobbers have not begun to order on a large scale. They seem to be feeling their way with great caution, and as they are able to take care of current demands with comparatively light stocks they are waiting for a more firmly established market. As prices appear to have reached a solid adjustment, however, a more general movement is anticipated within the next month. The Macy Mfg. Company, Los Angeles, has taken a contract for about 9000 ft. of pipe for the Colton water system.

Old Material.—The first cargo of steel scrap to be shipped from San Francisco to New York will leave in a few days, and additional cargoes are to be sent as rapidly as vessels can be chartered at satisfactory rates. There is practically no market for this material on this coast and several good sized lots are being held by other parties than those who are shipping it out. Cast iron scrap is in a rather stronger position than before. A number of small holders are disposing of occasional small lots of light material at low prices, but little good heavy machinery scrap is to be had from the yards at less than $19 per ton. The larger holders are asking $20 and expect to get that much within the next two months. The tonnage in the yards is moderate and the only large lots coming out are from the ruins of the City Hall and the old dry dock at the Union Iron Works, which is now being wrecked by the California Iron Yard Company.

The Moore & Scott Iron Works of this city has made overtures to W. A. Boole & Sons, Oakland, for the purchase of their shipyards on the Oakland estuary.

The California Saw Works is planning to erect a large concrete factory building at Seventh and Brannan streets, where it will install one of the most complete plants on the Coast.

The Steiger & Kerr Stove & Foundry Company is making extensive improvements in its factory.

The Union Iron Works is preparing to move its Sixteenth street dry dock to another location. As this company now controls the entire dry dock accommodations of this port, a number of local shipping men are at work on a project to build a large steel floating dock and start a company in opposition.

The Acme Iron Works has been incorporated at San Jose, Cal., with a capital stock of $200,000, by J. M. Johnson, C. C. Herbert, A. C. Johnson, L. H. Johnson and C. C. Spaulding.

The Risdon Iron Works has taken a $26,400 contract for boilers for the State Hospital at Agnews, Cal.

The Union Iron Works Company has taken contracts for two of the submarine torpedo boats authorized by Congress.

The Honolulu Iron Works, Honolulu, has a contract to build a nine-roller mill for the Hilo Sugar Company.

Harron, Rickard & McCone, the local machinery house, have leased a large lot on which they will erect a five-story building immediately. On its completion they will make considerable addition to their stock.

Birmingham.

BIRMINGHAM, ALA., March 15, 1909.

Pig Iron.—The market is at least 50c. per ton lower than at the time of last report, without tangible evidence that the lowest level has been reached. A schedule of $12, Birmingham, for No. 2 foundry was adopted within the past week by the majority of producers as an asking price, but the conditions in existence are such that the quotation can only be considered a nominal one. Of the sales reported below such figures, no details can be had, and the tonnage available at a greater concession is generally considered limited, yet the inquiries that have come forward since the revision of steel quotations have in but the fewest number of cases taken any semblance of an earnest effort in the way of prices, and the prospects for the coming week indicate that a very limited tonnage would be sufficient to take care of the demand. The various reports as to the movement from furnace yards continue favorable, and the actual melt has so far been curtailed but little on account of trade conditions, but the stock on founders' yards is probably larger than at any time for some years, and the extent to which such accumulations will offset provision yet to be made for second half requirements can only be conjectured. It is known that some of the leading local melters have ample stocks actually in hand to take care of their requirements during the remainder of the first half and possibly through the first quarter. There is practically no interest manifested by producers or melters as to second half engagements. In the case of the former an optimistic feeling prevails by reason of the limited commitments for delivery beyond the first half. The fact remains, however, that unless there is a material improvement in the consumption during the first half, or the production is reduced, the second half of the year will be entered into with stock of proportions not conducive to satisfactory market conditions.

Cast Iron Pipe.—The city of Mexico is expected to enter the market for a round tonnage within 30 or 60 days. Of the orders recently placed, small municipalities have been the principal purchasers, but the aggregate is quite attractive and prices fairly satisfactory. The inquiry for small lots is promising and the larger contracts held in abeyance at this time will, no doubt, be advertised at an early date. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $26; 8 to 12 in., $25; over 12 in., average $24, with $1 per ton extra for gas pipe. These prices are probably shaded on large municipal contracts.

Old Material.—By reason of the decline in pig iron prices, quotations on this material are further revised. There is still no demand other than for light cast and stove plate and the movement of those grades is of little consequence. Dealers' asking prices, which are nominal in the main, are as follows, per gross ton, f.o.b. cars here:

Old iron rails	$13.50 to $14.00
Old iron axles	14.50 to 15.00
Old steel axles	12.00 to 12.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country	9.00 to 9.50
No. 2 country	8.50 to 9.00
No. 1 steel	9.00 to 9.50
No. 1 machinery	9.50 to 10.00
Tram car wheels	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Stove plate and light cast	7.50 to 8.00
Cast borings	4.00 to 4.50

St. Louis.

ST. LOUIS, March 15, 1909.

Building activity is on the increase, and the month of February closed $300,000 ahead of that of last year. The predictions for March are that it will also exceed the corresponding month in 1908, and the outlook for the entire year is very bright. There was, it is estimated, an increase in population in 1908 of over 10,000 persons, and on the basis of the new city directory to be issued early in April, the population of St. Louis is 761,000. Plans and estimates, it is reported, have practically been completed for a passenger and express subway from downtown to Taylor avenue, the cost of which has been estimated at nearly $40,000,000, and an ordinance is being prepared for introduction into the Municipal Assembly early in April. Wm. J. Gates, assistant secretary of the Arkansas-Pacific Railroad Company, is in charge of the affairs of the company, which has been organized for the purpose of building the subway. New York City capitalists are said to be backing the enterprise.

Coke.—The market for coke appears to be featureless. No change for the better, either in demand or price, seems to be looked for until there is an improvement in the pig iron situation, notwithstanding the price of coke is low and apparently at bottom figures. Sales are closely confined to small lots for prompt shipment. We quote for standard Connellsville foundry coke, $2.15 to $2.25, at oven, for prompt shipment, and $2.25 to $2.50 for delivery over the year. High sulphur coke ranges, for prompt shipment, at $1.85 to $1.90.

Pig Iron.—it is hoped that the demand now setting in for iron and steel in building operations will, in turn, stimulate buying of pig iron. There is some inquiry for shipment over the first, and also over the second half, but it is thought the inquiry for the latter delivery is merely for the purpose of getting posted. In one of the larger offices it was learned that inquiries for shipment over the first half aggregated 1400 tons, and some sales had been effected ranging from car lots up to 300 tons. Other offices report business of moderate volume. There is some improvement in the movement of contract iron, though in some instances requests are being made to have shipments held. The market is quite steady and fairly firm on the basis of $12.25 to $12.50, Birmingham, for No. 2 foundry, for shipment over the first half.

Old Material.—Leading dealers state that they find no improvement in the situation except that the recent offerings of local railroads were taken up in spite of the dullness of the general market. Stocks in yards are practically the same as on hand January 1, nearly all the business current since that date having been confined to new track purchases, these lots being disposed of to avoid expense in the yards. The only railroad offering reported for the week is 300 tons by the Cotton Belt. There is no Eastern shipping demand and very little local inquiry or among the lead-

ing dealers. The only exception reported is relaying rails, which continue scarce and are wanted at full value. We have no change to report in prices, which represent merely what is asked. Tariff agitation has, it is thought, brought about a hand-to-mouth policy on the part of large consumers. We quote, per gross ton, f.o.b. St. Louis, as follows:

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Mixed steel	8.00 to 8.50

The following quotations are per net ton:

Iron fish plates	$13.50 to $14.00
Iron car axles	17.50 to 18.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	11.00 to 11.50
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	10.50 to 11.00
Stove pipe and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.00 to 8.50
Railroad sheet scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	7.00 to 7.50

Lead, Spelter, Etc.—There is a good demand for pig lead from consumers and sales have been effected at 3.92½c. to 3.95c., East St. Louis. The lead ore situation continues practically unchanged at $25 to $25.50 per 1000 lb., Joplin. Spelter shows a decided improvement in demand, the price now ranging from 4.70c. to 4.95c., with 5c. asked for brass metal. While the demand is entirely confined to small lots, it has been, however, continuous through the week within the range of the prices quoted. Zinc ore is held at $36 to $37.50 per ton base, Joplin. The tendency is in the direction of a slight decline. The improvement in the lead and spelter trade leads producers to believe that the turn they have been looking for has come, though the stocks of stored spelter will continue to be a menace until disposed of. Tin holds up well and improved 30c. per 100 lb. There is no change in antimony or copper. The demand for these metals lacks the snap of the previous week, though fairly good.

A modern commercial building, to cost about $100,000, will be erected by the August Knight Estate on Washington avenue, east of Twelfth street, to be 75 x 150 ft., seven stories.

The Holbrook-Blackwelder Real Estate Trust Company will erect a building on the corner of Locust and Eighteenth streets for the Wertheimer-Swarts Shoe Company. The building will be 75 x 155 ft., seven stories, and cost about $300,000

Cincinnati.

CINCINNATI, OHIO, March 17, 1909.—(*By Telegraph.*)

The market in crude and finished products presents a less unattractive appearance to the leading factors concerned. That is about the best that can be said this week. The character of correspondence tends to show a disposition to contract as soon as the long expected tariff revision question is settled, and that particular thing is just now the barrier that seems to hold up all forms of large buying. The agricultural implement people are coming forward, with promise of business in both crude and finished lines, but the stove makers are apparently waiting. In those steel shapes used largely by vehicle manufacturers there is a constantly increasing demand at present cut prices, and some mills are behind 30 to 60 days on deliveries. The week has opened better with the tool builders, and the largest of these are getting ready for what they confidently believe to be substantial business as soon as tariff matters take definite form.

Pig Iron.—Some orders are coming in, but they are of the variety that ranges from a carload to 200 tons and for immediate needs. The pipe makers are feeling the market for a good sized tonnage, and the leading interest is credited with several small pickups in this territory at attractive prices during the week. The deal mentioned last week in which a large tonnage was being negotiated for the use of an Eastern plant of the largest interest, and expected to have been closed on Wednesday, is said to be still pending and a larger quantity is involved. It is rumored here that 40,000 to 50,000 tons is in negotiation for use of the largest pipe interest, which expects to secure the huge San Francisco contract, but the details are closely guarded. The Southern market is undoubtedly weaker, and through the aggressive hammering of the speculative interests and the overbought consumers the price has dropped nominally to $11.50, Birmingham, for No. 2 foundry, but with some interests still asking $12.50. A Southern product which is credited with having started the stories of $11.50 iron when the price was held closely at $12 is explained to have been a No. 3 off iron which was sold at $11, and for deliveries limited to the second quarter. Some inquiries have been received for third and fourth quarter prices, but furnaces are refusing to quote, the Northern ones because of the uncertainty regarding ore prices. Some offers have been received from large consuming interests on round lots at $11, Birmingham, for shipment over the remainder of the year, but representatives report that furnaces have turned all such business down. Reported as still pending is the inquiry from a large Kentucky jobbing foundry for 500 tons of Nos. 2 and 3 Southern foundry. There are some inquiries here from large Wisconsin and Michigan manufacturers of agricultural implements suggesting large contracts for delivery over the remainder of the year if the price is right. For immediate delivery and for the remainder of the first half we quote f.o.b. Cincinnati, with freight rates of $3.25 from Birmingham and $1.20 from the Hanging Rock District, as follows:

Southern coke, No. 1 foundry	$15.25 to $15.75
Southern coke, No. 2 foundry	14.75 to 15.25
Southern coke, No. 3 foundry	14.25 to 14.75
Southern coke, No. 4 foundry	13.75 to 14.25
Southern coke, No. 1 soft	15.25 to 15.75
Southern coke, No. 2 soft	14.75 to 15.25
Southern coke, gray forge	13.25 to 13.75
Southern mottled	12.75 to 13.25
Ohio silvery, 8 per cent. silicon	19.70
Lake Superior coke, No. 1	15.95 to 16.45
Lake Superior coke, No. 2	15.45 to 15.95
Lake Superior coke, No. 3	14.95 to 15.45
Standard Southern car wheel	22.25 to 23.25
Lake Superior car wheel	21.75 to 22.75

(*By Mail.*)

Coke.—Aside from a little contracting because of expired delivery, the coke market is listless. Reports from all fields indicate a shutting down of oven operations, though the price for furnace grades remains about $1.75 to $1.90, at oven. Here and there are some bargain lots of coke on track. There is a slight increase in the demand for foundry coke, which indicates that the melt is increasing in some districts. The price ranges from $2 to $2.65, at oven, for the Connellsville product.

Structural Material.—There is a feeling among the sales agencies here that an important improvement is due soon, and in the meantime every salesman is on the alert for announcements of projected building. The Indianapolis City Hall, which will require about 2000 tons, it is understood here is to be readvertised, all bids opened last week having been rejected.

Sheets.—A slight improvement in demand is reported. The largest mill in this district, which was shut down last week, is operating one of its three furnaces this week, making up stock principally for its own consumption. There is not enough stability in the local market to quote intelligently.

Bars.—Local agencies report a fairly good business on steel bars, those concerns having a trade with the agricultural manufacturing establishments reporting a fine run and behind on deliveries. Mills are firm on making contracts at the ruling price of 1.20c., read to expire on June 30. Small lots are booked at prices ranging from 1.25c. to 1.40c. Steel tire is selling well also, some concerns reporting deliveries in 30 days as the best they can do.

Old Material.—The large dealers have apparently reconciled themselves to the existing unpleasant conditions and are beginning to quote again on some items. Some sales of heavy melting steel have been made in this market on a basis of $11, gross ton, and one large dealer authorizes a price of $10 to $10.50 gross ton, f.o.b. Cincinnati; No. 1 railroad wrought, $10 to $10.50; No. 1 cast, $10.50; cast borings, $3 to $3.50; turnings, $4 to $4.50; iron axles, $14 net. Dealers are buying heavily at present prices.

The Cincinnati Iron & Steel Company has opened a pig iron and coke sales department in connection with its Cincinnati plant and placed in charge Robert Field, formerly representative of the Sloss-Sheffield and other Southern iron companies. The appointment dates from March 15.

Cleveland.

CLEVELAND, OHIO, March 16, 1909.

Iron Ore.—While a buying movement is not expected for some time, furnacemen are beginning to take considerable interest in the market, as is shown by the numerous inquiries that are coming in regarding prices. Consumers are hoping to get a slight reduction from last year's prices, but the ore men see no reason to take up the price question until furnacemen are really ready to buy. Last year the leading merchant ore interests delayed action fixing prices until June 12. The probability of ore being placed on the free list in the new tariff bill will have little effect on the ore men in deciding on prices. If any reduction is made it will be because of the cut in prices on rolled products. The movement of ore from the docks to the furnace yards has improved considerably. It is estimated that the March shipments will reach nearly 1,000,000 tons. Prices at Lake Erie docks, per gross ton, are as follows: Old range Bessemer, $4.50;

Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—While the market is not entirely lifeless, as it was for a number of weeks, there are few inquiries or sales. The largest sale reported was 500 tons of foundry iron for Eastern shipment for second quarter delivery. The order for about 1500 tons of foundry iron for which a northern Ohio boiler plant had an inquiry out last week for delivery during the second quarter and last half is understood to have gone to a Valley furnace. The only new inquiries reported are three for foundry iron aggregating about 1000 tons. Reports indicate that the volume of the melt remains about stationary. Prices are rather weak. We quote No. 2 foundry at $14.75, Valley furnace. Local furnaces are asking $15 for No. 2 for outside shipment. For March and second quarter delivery we quote, delivered Cleveland, as follows:

Bessemer	$16.40 to $16.65
Northern foundry, No. 1	16.15 to 16.40
Northern foundry, No. 2	15.75 to 15.90
Northern foundry, No. 3	15.25 to 15.50
Gray forge	14.50 to 14.75
Southern foundry, No. 2	16.35 to 16.85
Jackson County silvery, 8 per cent. silicon	20.05

Coke.—There are no inquiries for contract coke, and the only sales for prompt shipment reported are of very small lots. We quote Standard Connellsville furnace coke at $1.60, at oven, for spot shipment, and $1.80 to $2 on contract, and 72-hr. Connellsville foundry coke at $2 to $2.25 for spot shipment and $2.15 to $2.40 on contract.

Old Material.—The downward movement in prices which set in when the price reductions in finished lines were announced seems to have stopped, and quotations, which are still largely nominal, are the same as a week ago. The market is still in a very unsettled condition, there being no transactions to help clear up the situation. No inquiries are coming from consumers, and dealers are looking for little demand until the tariff question is settled. Two new railroad lists are out this week, one from the Baltimore & Ohio, with 6000 to 7000 tons, of which about 4000 tons is steel rails, and the other from the Lake Shore, which offers about 4000 tons, of which 2000 tons is old rails, mostly steel. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$12.50 to $13.00
Old iron rails	16.00 to 16.50
Steel car axles	17.00 to 17.50
Old car wheels	14.00 to 14.50
Heavy melting steel	12.00 to 12.50
Relaying rails, 50 lb. and over	21.50 to 22.50
Agricultural malleable	11.00 to 11.50
Railroad malleable	12.50 to 13.00
Light bundled sheet scrap	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$17.00 to $17.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	9.00 to 9.50
No. 1 busheling	10.00 to 10.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 cast	12.00 to 12.50
Stove plate	10.50 to 11.00
Bundled tin scrap	9.00

Finished Iron and Steel.—The largest order received during the week was for 11,000 tons of plates and shapes for three new lake boats, the contract for which the American Shipbuilding Company has just received from Eastern parties. The order was taken by the leading interest, and specifications for a large portion have already been received. The placing of these contracts for boats is understood to be the direct result of the cheaper cost of building, due to the reduction in price on steel. The shipbuilding company is hopeful of securing additional contracts for boats to be built during the early summer for interests that desire to take advantage of the lower prices. All the mill agencies report a satisfactory volume of business during the past week. Orders were mostly small, but they were numerous, and the tonnage averaged more than during the early buying following the price reductions. Many orders were for one and two car lots. The market has become more settled, and buyers, being more confident that present prices will be maintained, feel safe in giving current orders and larger specifications. The orders placed during the week were largely for steel bars, but the demand for structural material from carloads to 100-ton lots was good. The structural outlook has improved materially. Considerable small work has developed, and local fabricating plants have about all they can do at present. With the large structural shops in this territory the situation has improved materially, a fair amount of railroad bridge work being in sight. There is no evidence that the new prices on steel bars, plates and structural material are being shaded, and mills are firm in refusing to take orders at present prices for delivery beyond July 1. The structural market has been well tested by the King Bridge Company, which has the contract for 2400 tons of steel for the Brotherhood of Locomotive Engineers' Building, but the steel has not been placed, and it is believed that no concessions have been offered. The contract is pending for about 1600 tons of structural material for grade crossing elimination work in this city, and another contract that will come up soon will be for the new Bailey Building that will require from 1000 to 1200 tons. The Interstate Engineering Company has taken the contract for the structural steel work for the Rocky River Bridge, 300 tons, and the Toledo-Massillon Bridge Company the contract for a grand stand in the Toledo Baseball Grounds, 200 tons. Orders for the steel were placed during the week. One Eastern plate mill has lost considerable business in this territory because of its refusal to meet present prices. The new prices on sheets are being fairly well maintained by the independent mills. The demand for iron bars shows a slight improvement, some carload specifications coming from the railroads. Local mills quote iron bars at 1.25c., Pittsburgh.

Pittsburgh.

PARK BUILDING, March 17, 1909.—(*By Telegraph.*)

Pig Iron.—Not enough pig iron is being sold to indicate what prices are actually ruling. The largest sale reported was one of about 1000 tons of off Bessemer iron, bought by the Westinghouse Air Brake Company, the reported price being $14.50, at Valley furnace. The general pig iron market is weak, and it is probable that our prices would be shaded, possibly as much as 25c. a ton, if any important business was offered. We quote standard Bessemer iron at $15.50 and gray forge $13.50 to $13.75, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—Leading steel makers continue to quote $23, Pittsburgh, for Bessemer and open hearth billets, and $25 for sheet and tin bars. Very few new orders are being placed, and specifications against contracts are only fair. Reports are current that steel is being offered at less than the prices quoted above, but these reports are absolutely denied by makers.

(*By Mail.*)

The heavy reductions in prices on practically all kinds of iron and steel have undoubtedly brought out better buying, mostly of small lots, and the outlook is that new business will steadily increase. The betterment is particularly noticeable in structural material, plates and steel bars, actual orders for these products placed in the last three weeks being heavier than at any time in the past year and a half. While jobbers and consumers are not anticipating requirements, they are sending in orders more freely. The impression seems to be growing that prices are as low as they will go, and plans are under way for some large work that will require heavy tonnages of different forms of iron and steel. The situation is undoubtedly better from the standpoint of the order books, and if tariff revision was out of the way it is believed that business would forge ahead steadily. Pig iron is quiet, and prices are rather weak. Consumers are taking out iron at a fairly satisfactory rate, but stocks in the two valleys are heavy, and there is more disposition on the part of the furnaces to name lower prices to get business.

Ferromanganese.—While $42, seaboard, is being quoted, it is understood that this price has been materially shaded recently on several large lots for forward delivery.

Ferrosilicon.—The market is quiet, there being no large inquiries. We quote 50 per cent. at $62, Pittsburgh.

Muck Bar.—Owing to the decline in prices of gray forge pig iron and iron scrap, prices of muck bar are weaker, and we quote best grades, made from all pig iron, at $26, Pittsburgh. It is probable this price would be shaded if a large order was offered.

Wire Rods.—The leading interest continues to quote $33 for Bessemer wire and chain rods and $34 for basic rods, f.o.b. Pittsburgh.

Steel Rails.—One or two leading railroads are said to have negotiations under way for the purchase of a large tonnage of steel rails for 1909 delivery, but this business will not likely be closed for some time. The feeling is growing that purchases of rails by the railroads this year may not be any heavier than they were last year. The Carnegie Steel Company is receiving small specifications against contracts and has also booked some export business in both light rails and standard sections. New orders and specifications against domestic contracts for light rails it booked last week amounted to over 2000 tons. Standard rails remain on the basis of $28, Pittsburgh. Prices on rerolled light rails are quoted from $3 to $4 a ton under prices asked for light rails rolled from billets. Regular prices on the latter are as follows: $25 for 25 to 45 lb. sections, with $1

advance for 20-lb., $2 advance for 16-lb., and $3 advance for 12-lb.

Skelp.—Prices on steel skelp have materially declined, but are holding very firm on iron skelp. Specifications against contracts are reported by the mills to be coming in quite freely. We quote grooved steel skelp at 1.25c. to 1.30c.; sheared, 1.35c. to 1.40c.; grooved iron, 1.50c. to 1.55c., and sheared iron, 1.60c. to 1.65c., all f.o.b. Pittsburgh.

Plates.—The lower prices on plates are bringing out a good many new orders, and more are in sight. The local district court has granted an order authorizing the receivers of the Wabash-Pittsburgh Terminal Company to issue $500,000 worth of receivers' certificates to purchase 500 steel coal cars. These cars are to cost not over $1000 each and must be delivered in 60 days. This contract will likely be divided among several of the car companies. The Pure Oil Company, Philadelphia, is reported to be in the market for about 6000 tons of steel plates to be used in the building of oil storage tanks. The mills now have more actual orders on their books and their shipments are larger than at any time in the past year or more. It is said that the price of 1.30c., Pittsburgh, is being well maintained.

Structural Material.—The American Bridge Company has taken a large amount of new work, and a great deal is pending, much of which is expected to be placed in a short time. It is said that inquiries for structural steel are heavier than at any time for the last year and a half. The American Bridge Company has taken a contract for a bridge over the Kentucky River, Kentucky, for the Queen & Crescent, 6300 tons, also 2400 tons for track elevation for the Panhandle Railroad at Chicago.

Sheets.—The recent heavy reductions in prices have brought out a good deal of new business, and the American Sheet & Tin Plate Company is now operating to about 50 per cent. of its sheet capacity. Other leading sheet interests report an increase in operating capacity, and it is believed that the demand will steadily increase from this time forward. Some of the outside mills are complaining bitterly about the heavy cut in prices of sheets and the small cut in sheet bars, stating that it is almost impossible for them to come out whole.

Tin Plate.—On Thursday of last week the American Sheet & Tin Plate Company made a reduction of 25c. a box in prices of tin plate, making the base price of 100-lb. cokes $3.40, f.o.b. Pittsburgh. This reduction was heavier than expected by the outside mills, and was made sooner than anticipated. It has not been followed by a material increase in new orders. Most of the canning interests had placed their season contracts prior to the advance; and, of course, these will be adjusted to the new basis. On Monday next the American Sheet & Tin Plate Company will start up its New Castle Works in full, containing 20 hot mills, and will then have about 70 per cent. of its tin plate capacity in operation. We quote $3.40 for 100-lb. cokes, m.o.b. Pittsburgh.

Bars.—Specifications against contracts for steel bars are coming in very freely, and the impression is growing that at the price of 1.20c. it is perfectly safe to buy ahead. Most of the mills are refusing to book for delivery longer than July 1, and some sellers are restricting orders for delivery within 30 days. It is believed the agricultural implement makers and other consumers of bars will come in the market earlier than usual this year to cover their season requirements. New orders in iron bars are light, and specifications against contracts are only fair. It is stated that some consumers of iron bars have gone back to steel, owing to the lower prices ruling on the latter. We quote steel bars at 1.20c., base, Pittsburgh. The nominal price of iron bars is 1.40c., base, Pittsburgh, but this is probably being shaded.

Hoops and Bands.—Some small stray orders are being placed to meet current needs, but consumers are not placing contracts ahead until tariff revision is out of the way and they are satisfied that prices will not be lowered. Regular prices in effect, which we are advised are being held, are 1.60c., base, for steel hoops, and 1.20c., base, for steel bands, one-half steel card extras, all f.o.b. Pittsburgh.

Railroad Spikes.—This is one item in the iron and steel list that has not been openly reduced. A fair amount of new inquiry is in the market, and railroads are buying mostly for repair work, and no large contracts are being placed. One Western road has recently placed an order for about 1000 kegs with a local interest. The demand for the smaller sizes is fairly active. We quote railroad spikes at $1.70 for 5½ x 9-16 in., and $1.80, base, for the smaller sizes, in carload lots, 5 cents per keg additional being charged for small lots.

Merchant Steel.—Last week prices on steel shaftings were reduced three points, and we now quote cold rolled at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivered in base territory. A fair amount of new business is being placed, but it is mostly in small lots. New demand for merchant steels is light and specifications against contracts are only fair.

Merchant Pipe.—The heavy cuts in prices of pipe have not stimulated the demand to any extent, which is still principally for small lots for actual needs. The refusal of the mills to allow jobbers any rebates on pipe shipped out prior to February 19, has caused some feeling in the trade, the jobbers insisting that pipe en route and not delivered should have been allowed the benefit of the reductions in prices, but the mills are firmly refusing to make this concession. We note that some very heavy inquiries are pending for line pipe, which have been accelerated by the lower prices. The Oklahoma Natural Gas Company is figuring on a gas line into St. Louis, which will take 300 miles or more of 16-in. The Kansas Natural Gas Company is about to lay larger mains and is inquiring for 60 miles of 16-in. The Pure Oil Company of Illinois will shortly be in the market for inquiries for upward of 400 miles of 8-in., while a project is under foot to take natural gas into New Orleans, which, if it goes through, will require 400 to 500 miles of 12 to 16 in. The Philadelphia Company, a local concern, is in the market for 25 to 30 miless of 16-in. in diameter by 5-16 in. thick, plain ends, for West Virginia delivery. The mills insist that the demand for the larger sizes when field operations start will be heavier than the mills can supply. Some of the mills making iron pipe are declining to meet the low prices made by other makers.

Boiler Tubes.—Consumers are buying only in small lots for actual needs. The railroads are buying few tubes, placing only occasional orders for small lots for repair work.

Iron and Steel Scrap.—The scrap market is in very unsatisfactory condition, and prices have declined sharply. The list of the Pennsylvania Railroad, East, was closed March 10 and 11, and the prices obtained were lower than for some time. The Baltimore & Ohio list closed Tuesday, while the Lake Shore & Michigan Southern and the Norfolk & Western lists close Wednesday, and the Chesapeake & Ohio Thursday. These lists are all much larger than usual, and the prices realized, when made public, will give a pretty clear idea of actual values. Consumers are not taking in scrap freely, believing that prices will be still lower. We have reduced our prices on nearly all lines, and now quote, per gross ton, f.o.b., Pittsburgh, as follows: Heavy steel scrap, $14 to $14.25; cast iron borings, $8.50 to $8.75; bundled sheet scrap, $11.25 to $11.50; No. 1 cast scrap, $12.25 to $12.50; No. 2, $9 to $9.25; No. 1 railroad scrap, nominally, $14, but a great deal is on the market, and prices are weak; No. 1 cast scrap, $14 to $14.25; iron axles, $19 to $19.25. Sheet bar crop ends have declined sharply, owing to the cut in tin plate, and while we quote at $15.50, reports are that this price has been shaded. Low phosphorus melting stock, 0.004 and under, is $16.75 to $17. Rerolled rails, delivered at Cambridge, are $14.25 to $14.50. The Maryland Rail Company, Cumberland, Md., is out of the market at present as a buyer of rerolling rails. Steel axles are about $16; grate bars, $10.50 to $10.75; old car wheels, $14 to $14.25; machine shop turnings, $10.50 to $10.75; railroad malleable, $13; iron rails, $16 to $16.25; locomotive tires, $15.50 to $16. We note sales of about 2000 tons of heavy steel scrap at $14, delivered at Sharon, Pa., and 250 tons of cast iron borings at about $8.50, Pittsburgh.

Coke.—The demand shows a falling off. While a large number of ovens in the Connellsville regions and at other places have been blown out in the past week, other ovens have been started, and the coke output still seems to be in excess of actual demand. A number of independent operators are trying to maintain prices on furnace coke for prompt shipment at $1.75 per net ton, at oven, but others are selling as low as $1.60 for standard grades, and in some cases at a lower price. The Colonial Coke Company has shut down 100 ovens, and the Atcheson Works of the Republic Iron & Steel Company 100 ovens has also been shut down. Foundry coke of standard grades for prompt shipment is held at about $2 to $2.25, at oven. The output in the Connellsville regions last week was 260,987 tons, a decrease over the previous week of nearly 10,000 tons. In the Upper and Lower Connellsville regions there are 38,207 ovens, and last week 24,044 were active and 14,163 were idle.

The United American Iron & Steel Company announces the opening of a district office at 915 Farmers' Bank Building, Pittsburgh, in charge of A. F. Baumgarten, for the purchase and sale of scrap, new and relaying rails, &c. This company recently established a branch at Harrisburg, Pa., where it has a model yard, being equipped with every facility for unloading and shearing scrap at minimum costs, having capacity for handling 75 cars inside the yard.

Buffalo.

BUFFALO, March 16, 1909.

Pig Iron.—There is a better inquiry for most grades of foundry iron as compared with last week, being for the most part for prompt shipment or for present quarter delivery. New orders are generally small, from carload to 200-ton lots, in many instances being accompanied by hurry shipment requests, as are also specifications on contracts, indicating

that stocks are being held down to the lowest safe level. Prices remain as follows, f.o.b. Buffalo:

No. 1 X	$16.00 to $16.50
No. 2 X	15.50 to 16.00
No. 2 plain	15.25 to 15.50
No. 3 foundry	15.00 to 15.50
Gray forge	15.00 to 15.25
Basic	15.50 to 16.00
Malleable Bessemer	16.50 to 17.00
Charcoal	20.50 to 21.00

Old Material.—The market is still unsettled. Consumers are buying very little, simply filling in small quantities for immediate use where low prices can be obtained. The only material moving, and that in small lots, is that which can be bought by dealers at prices decidedly under the nominal schedule, to be put in yards for storage. Dealers' nominal prices per gross ton, f.o.b. Buffalo, are as follows:

Heavy melting steel scrap	$14.00 to $14.50
Low phosphorus steel scrap	18.00 to 19.00
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	14.00 to 14.50
Old steel axles	17.00 to 18.00
Old iron axles	20.00 to 21.00
Old car wheels	14.50 to 15.00
Railroad malleable	13.00 to 13.50
Boiler plate	12.00 to 12.25
Locomotive grate bars	11.75 to 12.25
Pipe	11.75 to 12.25
Wrought iron and soft steel turnings	8.50 to 9.50
Clean cast iron borings	7.00 to 8.00
No. 1 busheling scrap	12.50 to 13.00

Finished Iron and Steel.—In bars and plates the market is quieter than a week ago. For fabricated steel inquiries are coming in a little more briskly, some of them developing into orders. Architects report considerable work now on their boards, involving structural material, which will undoubtedly develop into orders of considerable tonnage soon. Revised bids have been called for from the nine general contract bidders, whose bids were under $700,000, on the new Ononda Hotel, Syracuse, involving 1400 tons of steel. New plans have been prepared and new bids will be received March 22. Kratzer & Co., Pittsburgh, were, last week, awarded contract for the structural steel for the Temple Theatre Building, Rochester, which they will fabricate and erect. The steel, about 500 tons, will be furnished by the Jones & Laughlin Steel Company. Bids were received last week for the structural steel for Shea's Theatre, Toronto, about 500 tons, but the contract has not yet been awarded.

New York.

NEW YORK, March 17, 1909.

Pig Iron.—Interest centers chiefly in the New England market, where there have been a number of sales of round lots and where northern New York, Virginia and Alabama makers are sharply competing for business. Sales in that territory have been made as low as $16.50, in some instances, but better prices are being realized in others. We quote $16.75 to $17 for No. 1 Northern foundry, $16.25 to $16.50 for No. 2 foundry and $15.50 to $16 for No. 2 plain. Alabama Iron is quoted at $16.50 to $16.75 for No. 1, and $16 to $16.50 for No. 2 foundry.

Steel Rails.—The Harriman lines have inquired for 13,000 tons of rails for delivery at Guaymas, Mexico, in July and August. There is also an inquiry for 16,000 tons from the Cuba Railroad. The New Haven requirements are not definitely known, but are reported to have been revised from 20,000 to 12,000 tons. Among business taken by the leading interest are the following orders: Chicago & Great Western, 5000 tons; Duluth & Iron Range, 1500 tons; New Orleans & Northeastern, 1400 tons; Duluth, Missabe & Northern, 2300 tons; Marshall & East Texas, 2000 tons. Thus far no deviation is known from the $28 basis for heavy rails.

Structural Material.—Among business closed by the American Bridge Company is the contract for the Jordan-Marsh Building at Boston, 4000 tons. This company will also fabricate the steel for the addition to the Union League club house at Philadelphia, 1200 tons. On the new Pier 53 construction, which the city is expected to put through in the near future, the McHarg-Barton Company is low bidder for the general contract. Post & McCord have the general contract for the Schlegel Building, about 2500 tons. The steel for the Bryant Building at Nassau and Liberty streets has not yet been given out. Among railroad work awarded is 1200 tons for the Pennsylvania Railroad's work at Sunnyside, Long Island; 1200 tons of elevated work at Chicago, for the Pennsylvania Lines West, taken by McClintic-Marshall Construction Company, and 400 tons for the Erie Road, which went to the same company. The Erie has inquired for 800 tons of bridge work in addition. The inquiries for railroad bridges and elevated work, amounting to 50,000 tons, including the projected Reading work at Philadelphia, have not resulted in orders, for the most part, but decisions are expected soon. Of the above an inquiry not yet mentioned is that of the Lake Shore for 8000 tons. The addition to the Whitehall Building, this city, now seems more likely to be proceeded with, 10,000 to 12,000 tons being required. There is still irregularity in structural steel prices, but on ordinary lots of plain material the following prices are named for mill shipments delivered at tidewater: Beams, channels, angles and zees, 1.46c.; tees, 1.51c. On beams, 18 to 24 in., and angles, over 6 in., the extra is 0.10c. Structural material, cut to lengths, is sold in small lots at 2c. to 2¼c.

Ferroalloys.—Some 80 per cent. Ferromanganese has been sold as low as $42, Baltimore. Sales for spot shipment have been made this week at around $43. For 50 per cent. Ferrosilicon the price is $60, Pittsburgh, although on a desirable order this might be shaded.

Bars.—The trade in bar iron is exceedingly quiet. Indications are appearing of the scantiness of stocks in consumers' hands through the frequent requests for quick delivery on small lots. Prices show no change, common iron being quoted at 1.30c. to 1.40c., and best refined iron at 1.45c. to 1.50c. at tidewater. Steel bars are ordinarily quoted at 1.36c. to 1.41c., tidewater, but reports are current of slightly lower prices being made.

Plates.—Considering the prevailing conditions of general business, quite a fair trade is now moving in small lots. Eastern manufacturers are holding to 1.46c., tidewater, on desirable business, and name 1.56c. on small lots, on the tank plate basis.

Cast Iron Pipe.—The outlook is more encouraging, as quite a little inquiry has sprung up and spring business is now coming out, although in small quantities. The volume so far is not up to that of the corresponding season in recent years. At present no large lettings are in sight in this immediate vicinity. Carload lots of 6-in. are quoted at $23.50 per net ton, at tidewater.

Old Material.—No change for the better is yet visible. About the only demand now current is either coming from foundries or from specialty manufacturers who are better employed than those turning out standard products. A little larger movement is observed in old car wheels which are again in some demand for export. Dealers are still having trouble in making deliveries on contracts and are compelled to make sacrifices to dispose of material which buyers are refusing to accept. The following quotations are per gross ton for New York and vicinity:

Old girder and T rails for melting	$10.00 to $10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	19.00 to 19.50
Old iron rails	14.50 to 15.00
Standard hammered iron car axles	15.00 to 15.50
Old steel car axles	14.50 to 15.00
No. 1 railroad wrought	12.50 to 13.00
Iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	10.50 to 11.00
Light iron	6.00 to 6.50
Cast borings	5.00 to 5.50
Wrought turnings	6.00 to 6.50
Wrought pipe	8.00 to 8.50
Old car wheels	13.50 to 14.00
No. 1 heavy cast, broken up	11.50 to 12.50
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	11.00 to 11.50

Iron and Industrial Stocks.

NEW YORK, March 17, 1909.

The fluctuations in stocks since last report have not been wide, as no special influence operated in either direction. The whole stock market appeared to be waiting for developments in the extra session of Congress, which opened on Monday. The range of prices on active iron and industrial stocks from Thursday of last week to Monday of this week was as follows:

Allis-Chalm., com.	13½	Republic, com.	19¼- 20¼
Allis-Chalm., pref.	41 - 43	Republic, pref.	71½
Beth. Steel, com.	19⅛- 21	Sloss, com.	71¾- 72½
Can, com.	8 - 8½	Pipe, com.	25⅝- 26½
Can, pref.	75¼- 76¼	Pipe, pref.	66⅛
Car & Fdry, com.	48 -*48⅞	U. S. Steel, com.	43¼- 44¾
Car & Fdry, pref.	110 -*110½	U. S. Steel, pref.	110 -110¾
Steel Foundries	35 - 35½	Westinghouse Elec.	77 - 77½
Colorado Fuel	31⅝- 32⅝	Chi. Pneu. Tool	22
General Electric	151¾-153¼	Am. Ship, com.	55
Gr. N. ore cert.	65⅛- 66¾	Cambria Steel	34¾- 35
Int. Harv., com.	67⅛- 68	Lake Sup. Corp.	18½- 19
Int. Harv., pref.	112 -112⅛	Penna. Steel, pref.	103⅛-104½
Locomotive, com.	50 - 51	Crucible Steel, com.	6½
Pressed Steel, com.	35 - 35½	Crucible St., pref.	53¼- 54¾
Pressed Steel, pref.	97¼	Harb.-Walk. Ref., com.	17
Railway Spr., com.	35 - 35½	Harb.-Walk. R., pr.	80 - 81

* Ex-dividend.

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 45, preferred 111, bonds 103; Car & Foundry common 48¾, preferred 110½; Locomotive common 51, preferred 111½; Colorado Fuel 32½; Pressed Steel common 35¼, preferred 97¼; Railway Spring common 36; Republic common 20½, preferred 71; Sloss-Sheffield common 72; Cast Iron Pipe common 27⅛, preferred 70; Can common 8⅛, preferred 76.

The American Steel Foundries and subsidiary companies report for the quarter ending January 31, 1909, as follows: Earnings from operation and net income of subsidiary com-

panies, $183,856; income from interest, discount and exchange, $6228; income from investments and loans, $3361; miscellaneous, $782; total income, $194,228. Deductions: Interest on indebtedness, $31,368; interest on bonds outstanding, $45,550; in sinking fund, $12,525; bonds, sinking fund installments, &c., $26,250; depreciation, $31,818; total deduction, $150,511; balance net income, $43,717.

The net earnings of the Washburn Wire Company for the fiscal year ended December 31, 1908, amounted to $309,021, a decrease of $201,358, as compared with the previous year. The surplus at the end of the year was $234,700, an increase of $67,010.

Dividends.—The American Iron & Steel Mfg. Company has declared quarterly dividends of 1¼ per cent. on the common and preferred stocks, both payable April 1.

The United Shoe Machinery Company has declared the regular quarterly dividend of 2 per cent. on the common stock and 1½ per cent. on the preferred stock.

The Westinghouse Air Brake Company has declared the regular quarterly dividend of 2½ per cent., payable April 10.

The Otis Elevator Company has declared a quarterly dividend of 1½ per cent. on the preferred stock and a semiannual dividend of 1½ per cent. on the common stock, both payable April 15.

The Union Switch & Signal Company has declared the regular quarterly dividends of 3 per cent. on the common and preferred stocks.

The Canadian General Electric Company has declared the regular quarterly dividend of 1¾ per cent. on the common stock and the regular semiannual dividend of 3½ per cent. on the preferred stock, both payable April 1.

The American Smelting & Refining Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 1, and 1 per cent. on the common stock, payable April 15.

The American Can Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable April 1.

The National Enameling & Stamping Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable March 31.

The Crucible Steel Company of America has declared a quarterly dividend of 1 per cent. on the preferred stock, payable March 31.

The International Nickel Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable March 31.

Metal Market.

NEW YORK, March 17, 1909.

Pig Tin.—On Tuesday of this week more tin was bought and sold than on any day in the last fortnight. The total turnover, however, did not exceed 250 tons for both spot and future delivery. The market has otherwise been very dull, but prices have steadily declined. The range during the week has been as follows:

	Cents.
March 10	28.65
March 11	28.90
March 12	28.85
March 15	28.45
March 16	28.20
March 17	28.50

The low price Monday was the result of some tin pressing on the market, and on the following day these sales unsettled the London market. Some one evidently is overloaded with tin and is seeking a buyer. It illustrates the dullness of trade when such small sales as these can exert such an influence on prices. On Tuesday sales were made at a very low price of tin in an Eastern steamer lying at dock. The next auction sale of Banca tin will take place March 25, and will amount to about 2000 tons. The steamer sailing from London to-day is taking on an additional cargo of tin. The arrivals so far this month are 3722 tons, and about 2500 tons are afloat for American ports. The London market is higher this afternoon at £129 2s. 6d. for spot and £130 1s. for futures.

Copper.—Prices are lower and little or no business is in sight. So few transactions have been made that it is difficult to determine the actual prices. Lake ranges between 12.62½c. and 12.87½c. It has been offered at 12.75c. Electrolytic in large lots is available at 12.25c., and sales have been made at 12.12½c. A little hope has lately been seen in the advancing London prices. Early Tuesday the quotation on spot copper in London was £54 12s. 6d., a decline since our last report of £1 7s. 6d. The three succeeding quotations were all at advances, and the market closes there this afternoon at £55 5s. for spot and £56 for futures. Considerable speculative buying has taken place, but consumers have not entered the market in a large way. The exports are much better than last month, amounting to 11,014 tons for the first 16 days of March. Curtailment of production would, in the minds of many, seem to be the only logical means which could be taken to steady the market.

Spelter.—Prices are unchanged from last week at 4.80c. to 4.85c., New York, and 4.65c. to 4.70c., St. Louis, for prime Western brands. The pressure to sell observed for the last month has lessened.

Pig Lead.—Quotations have again advanced. Desilverized lead, which is held at 4.10c. by the leading producer, is offered at 4.07½c. by outside interests. Soft Missouri brands, which were quoted at 3.97½c. to 4c. last week, are not now obtainable for less than 4.02½c. for spot delivery. Shipment lead is held at the unchanged price of 4c. by the American Smelting & Refining Company in 50-ton lots.

Antimony.—Prices are unchanged from last week. Hallett's can be had at 7.75c., Cookson's at 8c., and less well known brands at 7.50c.

Tin Plate.—An unexpected cut in price was made last week. This reduction of 25c. brings the base price of 100 lb. IC coke plates down to $3.64 New York, and $3.45 Pittsburgh. A rebate of 5c. per box is generally allowed on carload orders. This is the first change in the price of tin plate since January 6, 1908, when the price was reduced 20c. per box. In Swansea, Welsh plates are 1½d. lower at 11s. 6d.

Old Metals.—Business is quiet, but in some quarters there is a noticeable accumulation around these prices. Dealers' selling prices are lower than last week, as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.50 to 11.00
Brass, heavy	9.00 to 9.25
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	7.75 to 8.00
Composition turnings	9.50 to 9.75
Lead, heavy	3.75 to 3.80
Lead, tea	3.50 to 3.55
Zinc scrap	3.65

The Municipal Explosive Commission of the city of New York, 157 and 159 East Sixty-seventh street, will hold a test at 3 p.m., March 26, at the east side of Twelfth avenue, between Fifty-seventh and Fifty-eighth streets, of cans and containers for keeping, carrying and dispensing volatile inflammable liquids. All manufacturers and dealers are notified to submit and demonstrate samples of their wares at the time and place named. Patrick A. Whitney, deputy fire commissioner, is chairman of the commission and Franz S. Wolf is secretary.

The Hudson & Manhattan Railroad Company completed the bore of its final tunnel under the Hudson River from Jersey City to New York March 11. The day was the fifth anniversary of the piercing of the first of the McAdoo tunnels under the Hudson, and the tube now open is the sixth under this control. It is expected that trains will be running from Jersey City to the great terminal at Cortlandt and Church streets, New York, by July 1.

Announcement is made that the Rockwell Furnace Company, 26 Cortlandt street, New York, has purchased the factory, drawings, patterns, &c., of the Rockwell Engineering Company, and the business will hereafter be transacted under the name of Rockwell Furnace Company, incorporated under the laws of the State of New York.

The Standard Steel Car Company, Pittsburgh, is arranging to place its Butler plant in partial operation for the manufacture of several thousand cars ordered by various railroads. This will enable it to employ about 1000 of its old men and allow it to operate on a moderate basis for several months, even if no more contracts are secured.

The ship subsidy bill which passed the Senate some weeks before was defeated in the House at Washington March 2 by a vote of 172 to 175. It provided for subsidizing mail lines to South America, the Philippines, Asia and Australia on a moderate scale, the intention being to extend the principle if this experiment proved successful.

The Wickwire Steel Company has removed its general offices from the White Building, Buffalo, to the plant of the company at Wickwire, on the Niagara River, just north of the city, Postal Station B, Buffalo.

OBITUARY.

IRVING PETER DILLON, principal owner of the Dillon Machine Company, Lawrence, Mass., died March 7, aged 58 years. He was born in North Shefford, Quebec, Canada, and his early life was spent there. When still young he removed to Sherbrooke, Canada, and about 20 years ago located in Lawrence, where he established himself as a builder of paper making machinery. He leaves a widow, five sons and three daughters.

JOHN HENDERSON STEWART, Pittsburgh, died suddenly from heart failure March 11, aged 45 years. He was born in Homewood, and was the son of D. A. Stewart, at one time chairman of Carnegie Brothers & Co., Ltd. After graduating from the University of Pittsburgh he attended Stevens Institute, Hoboken, N. J., and in 1884 returned to accept a position with the Keystone Bridge Company. Later he became connected with the iron and steel brokerage house of F. F. Vandevoort & Co., which was merged with Humphreys, Stewart & Co., and finally became Humphreys, Griffin & Co. He retired from active business five years ago. He leaves a widow, a son and a daughter.

JOHN EDWARD ALEXANDER, lately general manager of the Rhode Island Perkins Horse Shoe Company, Providence, R. I., died March 6, aged 47 years.

FRANKLYN W. BRUCE, founder of the firm of Bruce & Cook, New York City, died at his home in Paris, France, March 6, aged 78 years. The original business of importing tin plates and metals was started by John M. Bruce in 1812, but the present firm was organized in 1855. Mr. Bruce had made his home in France since the early sixties. He was a frequent writer on financial and economic topics. He leaves a widow.

The Cambria Steel Company.

The annual report of the Cambria Steel Company presents the following showing of income for the year ending December 31, 1908, with which the figures for 1907 are compared:

	1908.	1907.
Net earnings from operations.....	$824,159.45	$3,888,199.39
Receipts from rents, income from investments, interest on bank accounts, profit on ore sold, &c....	1,067,690.42	1,094,754.91
Total	$1,891,849.87	$4,982,954.30
Deduct fixed charges under Cambria Iron Company lease and incidentals	398,093.48	420,687.58
Net income	$1,493,756.39	$4,562,266.72
Which has been appropriated as follows:		
Dividends	$1,350,000.00	$1,350,000.00
Set aside to betterments and improvement account.....	.....	2,200,000.00
Set aside to depreciation fund.....	100,000.00	1,000,000.00
Total.....	$1,450,000.00	$4,550,000.00
Balance carried to credit of profit and loss account.....	43,756.39	12,266.72
The profit and loss account which had a credit December 31, 1907, of.....		$2,356,218.43
Has been increased by balance of income account transferred as above.....		43,756.39
By collection of accounts charged off in previous years.....$28,242.07		
Less bad or doubtful accounts in 1908. 24,509.39		3,732.68
Leaving balance to credit of profit and loss account, December 31, 1908.....		$2,403,707.50

From the accompanying statement of Chairman E. B. Morris and President Powell Stackhouse, the following extracts are taken:

The coal, iron ore and limestone properties owned or controlled by the company produced satisfactory results. Explorations for ore are being continued on a large body of land in Michigan held under option, thus far with negative results.

Considerable expenditures have been made at the Cambria plant, generally in line of completion of improvements and betterments authorized in 1907, under progress at the beginning of the year. A continuous heating furnace is being added to the beam mill, with capacity to heat 400 tons of steel per day. This will be operative in March. An 18-in. continuous mill on the site of the old No. 2 mill, to be operated in connection with the 48-in. blooming mill, was authorized in December, and should be productive in the early part of next year, unless unduly delayed by business conditions. This necessitated the removal of the 13-in. mill from its present congested location to the Gautier plant, where by moderate additions its output can be materially increased. During the year five of the six furnaces were relined and repaired, and the stack of No. 5 is being rebuilt. With the addition of the steel stock bins and charging appliances the blast furnace plant is now in better condition for economical work than heretofore.

The output of the Gautier plant constitutes an important branch of the company's business, and was less affected by the business depression than the other finishing departments. It is expected that additions will be made to this plant as they are required to meet the normal demand upon it. These will probably follow the completion of the continuous mill.

At the Franklin plant the blast furnaces were both relined. Some progress has been made toward the completion of the spare gas blowing engine, and which should be operative during 1909. The tendency toward the use of open hearth steel clearly indicates the necessity of further increase of the open hearth capacity.

The physical condition of the entire plant has been fully maintained by current repairs and additions. There was expended for improvements $560,548.52; of this amount $482,080.44 was charged to plant additions and the remainder, $78,468.08, was repaid by amount realized from sales in 1908 of real estate and minerals, under the terms of the lease from the Cambria Iron Company. There was expended, in addition, $352,225.10 for replacements and alterations, and charged to operating accounts.

From August to November, inclusive, the rainfall in the Johnstown District was only about one-quarter of that of the preceding year, which was a fair average, and even with the restricted operations of the plant, the management had serious difficulties in keeping the works running, and only at considerable extra expense, due to the rapid corrosion of pipes and tools from the acid water it was forced to use. Under the conditions that prevailed during this period it would have been impossible to have maintained an average output.

Shipments of steel show a decrease of 43 3-10 in quanity and 42 3-10 per cent. in gross value of all products, compared with the preceding year. The falling off in business was most pronounced in all lines of products used by the railroads, as shown by the comparative percentages of the company's output with 1907; *i. e.*, rails 28 per cent., cars 21 per cent., locomotive and car axles 38 per cent., while steel that was in more general use—bar and agricultural steels, the demand was 64 per cent., structural shapes 54 per cent. and plates 46 per cent.

On account of the continued illness of Charles Dorf Mix, the partnership existing between him and Andreas Hartel, Jr., under the style of Mix & Hartel, 102 Purchase street, Boston, Mass., was terminated February 27. A new partnership, under the style of Hartel Brothers & Co., has been formed between Andreas Hartel, Jr., formerly of Mix & Hartel; Walter W. Hartel, for many years with the Cambria Steel Company, and George H. Burnett, for the past five years with Mix & Hartel. They will continue business at the same address in tool steels, forgings, die blocks and steels of special analysis, sheared plates and high or low carbon sheets. They are agents for the Vulcan Crucible Steel Company, Allegheny Steel Company, Interatate Steel Company and Huron Steel & Iron Company.

W. M. Corse, Detroit, Mich., secretary of the American Brass Founders' Association, reports that the question of developing standard methods of analysis for brass has been taken up with the American Chemical Society and with the United States Bureau of Standards. Both have offered to co-operate with a committee on standards that will be appointed at the Cincinnati convention of the Brass Founders' Association in May.

The Machinery Trade.

NEW YORK, March 17, 1909.

In some branches of the trade there was a slightly better demand for single machines and small lots the past week, but transactions of any size were few. There has been received a fair volume of small inquiries which, like the orders, were mostly for the lighter machines. Almost the entire business being received is made up of machines either for replacement or for additions to equipment of some department, very few complete shop installations being reported and these for small shops. The little construction work under way on new industrial plants and additions and the inactivity of the railroads are not encouraging features. It is hoped that with a satisfactory settlement of the tariff the many important projects which have been held in abeyance for some time will be brought forward. Two good sized plants that were recently burned are to be rebuilt as quickly as possible, and requests have been received in the trade for catalogues and other data from one of them, the New Burrell-Johnson Iron Company, Yarmouth, N. S., which will buy a number of machine tools. The Central Foundry Company, New York, whose plant at Anniston, Ala., is to be rebuilt, has inquiries out for a couple of heavy lathes. In a recent closing for traveling cranes extremely low prices were made. The demand for steam specialties has been much better the past two weeks than for some time.

The fact that the ice crop of the Hudson River and other Eastern rivers and lakes has been very scant this season has interested many men, heretofore in the natural ice business, in the question of making artificial ice, and consequently there are many inquiries in this market at present regarding icemaking machinery. While manufacturers who specialize in this class of equipment will reap most of the benefits of any business that may accrue from that source, the general machinery trade will be helped. Power equipment manufacturers and dealers will, of course, get the major portion of the business that results from the establishment of artificial ice manufacturing plants, outside of the special icemaking machinery equipment, but conveying machinery men and manufacturers of general mill supplies will also benefit. Manufacturers of refrigerating machinery are unusually busy filling orders for equipment, and they say that their inquiries at present are larger than they have been during the last year or more.

The American Supply and Machinery Manufacturers' Association has arranged to hold joint conventions with the Southern Supply and Machinery Dealers' Association, Chattanooga, Tenn., May 5, 6 and 7, with headquarters at the Hotel Patten, and the National Supply and Machinery Dealers' Association to be held at Pittsburgh, Pa., May 12, 13 and 14, with headquarters at the Fort Pitt Hotel. As usual, those expecting to attend the meetings have been asked to notify F. D. Mitchell, secretary-treasurer, 309 Broadway, New York, in order that they can be furnished with identification badges with their names and the firms they represent.

Another of a series of smokers arranged by the Machinery Club was held in the club's quarters at 50 Church street, New York, Saturday afternoon, March 13, when there was a good attendance of members and their friends. A number of entertainers contributed to the programme, and a feature of the entertainment was the receipt of wireless messages, most of which were in a facetious vein and were in the way of jokes calculated to appeal to the trade based on existing business conditions and the like. Delegations of out of town members attended the affair, and the resident members were afforded an opportunity of meeting sociably many visitors with whom they have business connections.

Catalogues and other data are desired by the New Burrell-Johnson Iron Company, Yarmouth, Nova Scotia, to aid it in selecting the best equipment and materials for the new machine shop which it is to erect along modern lines in order to reduce the cost of manufacture to a minimum. The shop of the company, which manufactures marine engines, was recently destroyed by fire and will be replaced by a modern structure which will be equipped with about the same class of tools as were used in the burned building. In its shop it had a 30 x 30 in. x 6 ft. planer, an 8 ft. lathe, 4 ft. double ended lathe, 18 or 20 lathes of smaller sizes, 4 ft. radial drill and four or five other drills, a large slotter, one shaper, two medium sized planers, a bolt cutter, pipe threading machines, centering lathes and a milling machine. For the pattern shop there will be required a band saw, buzz planer, trimmer, &c. These are the principal machines which the company will purchase, but the requirements will probably cover several other machines, the exact number that will be needed not yet having been ascertained. It is probable that the company will not take up the purchase of machinery until the plans for the building have been prepared. H. S. Crowell is manager.

The Emerson Engine Company, Alexandria, Va., recently incorporated with a capital stock of $50,000, has purchased most of the machinery it will require, but is still in the market for additional tools suitable to the manufacture of marine engines; also supplies identified with engine manufacture, such as crank shafts, connecting rods and castings. The marine gas engines which the company makes can be reversed. They are said to be the lightest engines for their power yet produced, a 120-hp., six-cylinder speed engine weighing but 350 lb., and a 250-hp. cruiser type weighing 2600 lb. Victor L. Emerson is president and treasurer; H. E. Jenkins, vice-president and secretary.

An order amounting to about $20,000 has been placed with a prominent Liberty street machine tool house by the Norfolk & Southern Railroad. The order covers about 20 machine tools, which are to be installed in the shops at Berkeley, Va., and bids for which were sent in the latter part of January. The receivers of the Norfolk & Southern Railroad are spending considerable money in making improvements to the system and of the $1,000,000 provided for the improvements, about $65,000 is to be used for additional equipment for the machine shops.

The large machine tool list recently issued by the Delaware, Lackawanna & Western Railroad did not cover the traveling cranes that will be required for the shops at Scranton, Pa. The railroad got some data on these cranes, which include two of 20 tons capacity, about a year ago, but thus far they have not been purchased. Crane manufacturers are expecting that the road will soon issue specifications for the crane equipment.

Stockholders of the B. F. Avery & Sons Company, Louisville, Ky., will hold a special meeting on March 31 to authorize an issue of stock or bonds, the proceeds of which will be used in building a large plow plant in Louisville. The company has acquired 35 acres of land in the southern section of that city, and the plant will be constructed there.

The city of Newark, N. J., is planning to erect a commercial and manual training high school on High street, adjoining the present Newark Technical School. The Board of Education has set aside $650,000 for constructing and equipping the school and the structure will include three physical laboratories, a machine shop, molding room, pattern making shop, sheet and art metal shop and shops for wood finishing and wood joinery, in addition to instruction in business practice, stenography, &c. The plans have not been passed upon as yet, so the question of equipping the building with machinery will not be taken up for some time. It is expected that the buying will be done in this territory, and a good sized list of machinery equipment can be looked for later on, in addition to the power plant, which will necessarily be a large one.

E. L. Phillips & Co., 50 Church street, New York, have a contract for the construction of a large garage and automobile repair plant to be erected on the plot of ground bounded by West End avenue, Sixty-sixth and Sixty-seventh streets and the New York Central Railroad. The building will be four stories high and will cover an area of 44,000 sq. ft. No machinery equipment has been purchased as yet, and it is not known whether the E. L. Phillips Company will do the buying, which will probably include some machine tools and other machinery for repairing automobiles.

The Koppel Land Company, Machesney Building, Pittsburgh, an identified interest of the Arthur Koppel Company, builder of industrial cars for all purposes, has closed a contract with the Engel-Knupp Mfg. Company for the erection of a plant at Koppel, Pa., for the manufacture of indestructible roofing and gas and coal heating furnaces. The company has secured 10 acres at Koppel, on which the plant will be built. Negotiations are also pending with the Mann Air Brake Company for the erection of a plant at Koppel and also with the Logan Iron & Steel Company and Bennet & Co., founders and machinists, for the erection of plants at Koppel, and it is expected contracts with these concerns will be closed in a short time.

David T. Lawless, 87 St. Paul street, Rochester, N. Y., is receiving bids on the following equipment to be installed in a new paper mill he contemplates erecting at Penfield, N. Y., 7 miles from Rochester, and orders for which will be placed inside next 60 days: Two water turbines with capacity 300 hp.; two 100-kw. generators, with shaft connections to the turbines; one 150-hp. Corliss engine, to be used for auxiliary power; four 50-hp. motors, to drive paper machine; two boiler feed pumps, to supply 200 hp.; hangers, clutches, pulleys, belting and shafting.

Considerable equipment, including a large electric traveling crane, has been recently purchased by the Interstate Railways, whose headquarters are in Philadelphia, Pa. The equipment is for a new power plant.

Chicago Machinery Market.

CHICAGO, ILL., March 16, 1909.

Broadly speaking, the machinery trade occupies about the same position that it did at the beginning of the year; that is to say, it is characterized by an intermittent demand, the volume of which is but little increased. The orders that are being entered for various sorts of equipment are thus

far not significant of especial activity in any of the different manufacturing industries, but seem rather to represent the incidental requirements of individual plants, which under present conditions are not generally of a pressing nature. In electrical equipment the demand for small motors is rather more active than for the larger units, in consequence of which some of the shops are running reasonably full on such work. Reports from some of the leading houses handling boiler and structural shop tools indicate a moderate spurt in trade within the past week or two, the total of which was swelled somewhat by a few new equipment orders. The outlook for trade in structural shop equipment, however, is regarded as considerably more promising since the drop in prices on structural material, hence it is believed that many new construction projects involving the use of steel, not a few of which have been held up for some time in anticipation of this result, will come out. In fact, indications point to the development of a good deal of work of this kind in the near future which will have a tendency to stimulate the demand for the machinery required in fabricating shops.

The machine tool houses generally are very quiet. Two boring mills of fair size were included in last week's sales made by a leading interest, but the business as a whole is too small to afford anything like an even distribution. The equipment of a mining and mill machinery plant owned by the John A. Mead Mfg. Company, Chicago, was disposed of last week at an auction sale held by the receivers. The bulk of the tools were bid in by users and brought prices that were out of reach of the dealers. Only one small lot went to a selling interest.

The extension of the Northern terminal of the Chicago, Milwaukee & Gary Railroad from Rockford, Ill., to Milwaukee, Wis., and the present Southern terminal from Momence, Ill., to Gary, Ind., is an undertaking involving an ultimate expenditure of approximately $10,000,000, which has been financed by the St. Louis Union Trust Company. The road when completed will form an outer belt line about Chicago which will cross every one of the 32 roads entering the city, and will pass through a number of the most important nearby manufacturing towns. Work has been begun on the Gary terminal, which will require the construction of 26 miles of track. A link of 22 miles from Aurora to Joliet and another of 100 miles will be required to complete the line, which in all will comprise 251 miles of road. The section of the road now being operated runs from Momence to Rockford. The plans include enlargement of the present shops which are located in the latter place. These are not yet completed, but the improvements contemplated will involve the purchase of considerable new equipment.

A fire occasioned by an explosion of natural gas caused by leak in a pipe destroyed the plant of the Topeka Steam Boiler Works, Joseph Bromich, proprietor, Topeka, Kan. Although burned on March 2, work upon the reconstruction of the plant has already been begun and will be pushed as rapidly as possible to completion. In addition to the manufacture of steam boilers, tanks and like equipment, the business included the jobbing of pipe and steam and water supplies, all of which stock was either badly damaged or entirely destroyed. Much of the machinery, including 22 electric motors, was rendered unfit for use and will have to be replaced. The plant was one of the largest of its kind west of the Missouri River.

The Stetson-Ross Machine Works, Seattle, Wash., organized early in 1908 to build woodworking machinery, has recently been incorporated. The officers are G. W. Stetson, president, who is also at the head of the Stetson & Post Lumber Company; H. B. Ross, vice-president and designer, formerly connected with the Berlin Machine Works, Beloit, Wis., and F. M. Stetson, secretary and treasurer. The plant is centrally located with respect to the lumber business of the Northwest, and is equipped with modern tools adapted to the manufacture of machines for saw and planing mill use. The business has already grown beyond its initial capacity and the company is now in need of heavy planers, lathes and milling machines, which will probably be purchased in the near future.

The Huntsville Foundry & Machine Works, Huntsville, Ala., maker of sawmill machinery and general foundry work, is arranging to build a new foundry which will have about three times the capacity of the present plant. In addition to the products heretofore turned out, the company expects to build a line of gasoline and internal combustion engines which will be placed on the market during the present year. Material for the new building has already been purchased and when it is completed the equipment from the old plant will be first installed, and after this is in place the matter of additional equipment will be taken up. The motive power for the new plant will be furnished by an internal combustion engine made by the company, fuel for which will either be producer gas or gasoline.

Among the recent orders secured by Joseph T. Ryerson & Son are seven large punches, two Lennox roller splitting shears, two beveling shears of the same type and a Ryerson high speed friction saw purchased by the Heine Safety Boiler Company, St. Louis, for additional equipment in its new shop; also a large plate shear, double angle; four high speed punches, four riveting machines, a riveting gantry crane and a bulldozer press ordered by the Manitoba Bridge & Iron Works, Manitoba, Ont., Canada, for the enlargement of its present facilities.

Roth Brothers & Co., Chicago, manufacturers of electric motors, dynamos and special electric machinery, have built a new factory, now nearly completed, at Loomis and Adams streets, which they will occupy about May 1. The new building, which is two stories high, of reinforced concrete and brick construction, was especially planned and arranged for the accommodation of the company's line of work. Floor space 92 x 125 ft. is provided on each floor, all of which are of reinforced concrete. The equipment of the old shop will be installed in the new factory, in addition to which some new machinery will be purchased a little later, since the floor space to be occupied will be about double that of the present quarters.

The E. L. Essley Machinery Company, now located at 67 West Washington street, Chicago, has secured more commodious quarters in the Edgecomb Machinery Building, 60 and 62 West Washington street, into which it will move this week. The new room, which is 44 x 96 ft., will afford about twice as much space as is at present occupied by the company, besides being well adapted for the convenient arrangement and display of machine tools.

The name of the Northwestern Railway Supply Company, 8 and 10 South Canal street, has been changed to the Central Railway Supply Company. Coincident with this change O. D. Brigham, formerly purchasing agent of the Chicago & Northwestern Railroad, assumed the management of the company, which is sole agent for the Continental Rubber Works in Chicago and vicinity.

The Northwestern Normal and Industrial School, Aberdeen, S. D., will be in the market this spring for some machine shop, foundry and blacksmith equipment. H. W. Mansfield is director of manual and industrial arts.

New England Machinery Market.

BOSTON, MASS., March 16, 1909.

Little that is new appears in either the machinery, supply or steel market. The machine tool dealers have found no change in the active demand. The tools for which prices have been figured, but for which no orders have been placed, mount into a great total, but actual business is comparatively small. The steel men report no increase in sales. On the contrary, some of them state that business has fallen away since the cut in prices, buyers holding off for a lower market, or because they prefer to wait a while and watch developments, in the belief that there is small chance of a higher market at present. The structural steel people have not increased their buying, the supply in Boston and vicinity being well under the normal. The dealers in bars and other classes of steel are, as a whole, deferring the increase of their stocks. The railroads are buying as little as possible of everything.

In general manufacturing there is a kaleidescopic shifting of conditions. It is rather common to hear of cases where a manufacturer's business has suddenly changed from bad to good, or from good to bad, without apparent cause. This is all a part of the unsettled business atmosphere, of course, and tends to prolong the period of distrust.

H. L. Gilman, 26 Linden street, Brookline, Mass., has asked the trade for prices on a long list of machine tools, and several dealers are preparing bids on his requirements. Mr. Gilman is the head of an important enterprise entailing the erection in Boston of very large industrial buildings which will be rented to manufacturers. The project includes the establishment of a large machine shop, and the list covers the tools which will be needed for its equipment. When orders are placed the aggregate of the business should be large.

The Boston Automobile Show last week was the most successful of the annual series, both in the size and excellence of the exhibits and in the attendance, which was large and productive of more immediate business than ever before. The show afforded yet another proof of the popularity of the automobile and of the ability and willingness of the public to take the output of the manufacturers of cars and accessories. The exhibitors were well pleased to see the promise of the New York show accentuated in the exposition, the attendance of which is drawn from all over New England.

The R. P. K. Pressed Metal Company is establishing a factory at Bridgeport, Conn., for the manufacture of pressed metal goods. The New York office is at 753 Fifth avenue. It is a new corporation, with capital stock of $50,000. H. M. Kirkland is the president, and Arthur L. Ruland secretary and treasurer, the directorate comprising these officers and Irving Ruland, George A. Phelps and Milton B. Reach.

The Metropolitan Improvements Commission having in

hand the great transit problems of the metropolitan district, of which Boston is the center, has submitted its report to Governor Draper of Massachusetts. The recommendations, which go well into the future, include the building of a four-track subway connecting the North Station terminal of the Boston & Maine system, and the South Station terminal of the New York Central and New York, New Haven & Hartford lines, and the electrification of the entire suburban system. A marginal railroad, serving the waterfront of East Boston, is urged, together with important enlargements of Boston's dock system. The report goes somewhat into the details of passenger and freight terminal improvements.

The Heald Machine Company, Worcester, has secured the services of Arthur C. Hoefinghoff as its sales manager and he began his new duties March 1. Mr. Hoefinghoff has been for some time the manager of the machine tool department of the New Orleans branch of the Fairbanks Company. He is a brother of the late Harry C. Hoefinghoff of Cincinnati, who was head of the Bickford Drill & Tool Company, and was associated with him in the management of that business. Since that time he has had a wide experience as a dealer, and consequently is intimately conversant with both the manufacturing and sales ends of the business.

The Bridgeport Metal Goods Mfg. Company, Bridgeport, Conn., has been organized with a capital stock of $50,000, of which about $37,000 has already been taken up. The company will manufacture brass goods of various kinds, but is not ready to give out details of its product. Anker S. Lyhne is president; Frank W. Harmon, New Haven, Conn., vice-president, and Herman K. Beach, secretary and treasurer. Mr. Beach is a son of the late Nelson M. Beach, former treasurer of the Bridgeport Brass Company, and Charles Phillips, who will be the superintendent, has for a long time been identified with that company. The new corporation will occupy the old plant of the Springfield Emery Wheel Company on Spring street, and preparations are far advanced toward beginning manufacturing.

The United Shoe Machinery Company, Beverly, Mass., has voted to issue 89,583 shares of new stock, providing new funds to take care of the growth of the business.

The Baird Machine Company, Oakville, Conn., has brought out a new model of its automatic four-slide wire forming machine, which is extensively used by manufacturers of wire goods. The new type contains a number of novel features designed to increase efficiency.

The Mark Flather Planer Company, Nashua, N. H., has brought out a new planer drive and two-speed mechanism, containing interesting and efficient features.

The trade will be much interested in the announcement of the retirement of John R. Back from the F. E. Reed Company, of whose works he has been the superintendent for many years. He went with the company 30 years ago, and has had much to do with bringing the business to its present position, especially in the designing of its lathes and in their manufacture. The reason for his resignation is the wish to be relieved of the exacting duties of superintendent. He will continue to work with the company along mechanical lines in connection with the development of its product. Mr. Back is a prominent figure in the machine tool business.

The General Electric Company is to build another large addition to the foundry, at Pittsfield, Mass., duplicating the building erected last season. It will be 75 x 300 ft., of brick and steel construction, and will cost in the neighborhood of $100,000. The contract has been let for an addition to the main shop building, 205 ft. long, to be devoted to storage.

The wire business at Worcester is in a prosperous condition. The great works of the American Steel & Wire Company are operating upon about 80 per cent. of maximum production in common with the company's plants as a whole, and the plants of the Wright Wire Company, Morgan Spring Company and Spencer Wire Company are correspondingly busy. Certain special products are now out of season, and those departments are dull; but, on the whole, business is quite satisfactory by comparison with many other divisions of the metal industry.

The plant of the Standard Plunger Elevator Company, Worcester, is rushed with work, large contracts being in hand, chiefly for elevators for mercantile buildings in New York and Philadelphia.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 16, 1909.

Uncertainty as to the tariff revision is attributed to be the most potent cause of the backwardness of the corporations in ordering needed tools and equipment. Very apparent is it to the tool builders that something is radically wrong, for a few isolated cases of temporary shutdowns are to be noted. A note of encouragement was furnished, however, in the mails of Monday morning, which brought many inquiries. Careful inquiry fails to reveal any change on the part of the railroads; no part of the week's accumulation of inquiries, so far as could be learned, contained any good news from the railroads. The inquiries as a rule came from miscellaneous manufacturers and from dealers. Local manufacturers regard as a good omen the optimistic tone of letters from the latter.

The list of tools required for the Carolina, Clinchfield & Ohio Railroad Company is again held up, according to the information received on Monday by one of the largest builders of tools in this section. The award is now promised by April 1.

Manufacturers of ice machines and the medium and smaller electric power generating machines are still enjoying a nice run of business, the causes which operated to disturb trade in tools seeming to have little effect on these lines.

There is practically no inquiry of any kind from foreign dealers, and the tool manufacturers who early in 1907 were working with full forces to get out foreign work on four, six and eight months' future delivery are now the most affected and are feeling the silence of the foreign houses.

The foundries are doing the usual three heats per week, and in some cases those whose principal business comes from the machine tool builders are complaining of dullness.

The local Engineers' Club is agitating the matter of a permanent home. The question will be settled by vote at the Thursday evening meeting.

Improvements are progressing at the Jeffersonville plant of the American Car & Foundry Company. An important conference was held there recently by officials of the company. Those present were Frank Thompson, assistant to the general manager at St. Louis; James G. Lawler, manager the St. Charles, Mo., plant; Chief Engineer James Ames of St. Louis, and G. R. Scanlan, who was general auditor at St. Louis, but who took charge of the Jeffersonville plant on the death of the late manager, John D. Ingram.

E. C. Shapely of Philadelphia, representing the estate which owns the majority of stock in the Marietta, Ohio, steel plant which has been idle for some time, has been inspecting the property. The Marietta Board of Trade has been agitating the matter of reopening the works.

Treasurer Vance of the Kinnear Mfg. Company, Columbus, Ohio, states that the company's architects have been asked to prepare plans for building an addition to its plant, but that nothing definite has been decided as to when the improvement will be commenced.

President E. A. Langenbach of the Berger Mfg. Company, Canton, Ohio, has denied through the press any intention of cutting the wages of workmen in its sheet steel mill department, saying that the company is well equipped to cope with the present situation, unless wage cutting should become general or the tariff should be reduced so as to compel the lowering of wages to meet foreign competition. The company employs 1200 men in its sheet department. As the company uses a good portion of the sheet output in its finished products, the cutting of prices does not affect that establishment as it does some independent manufacturers.

The Zanesville, Ohio, plant of the American Rolling Mill Company has been shut down until the market shall improve.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 16, 1909.

Local machine tool dealers report no change in the condition of the market. Sales during the week were mostly single tools, very few orders being taken for over two tools. New inquiries are scarce, none of any size having developed. There is considerable business that has been pending for some time, but many prospective buyers are slow in placing orders. The present inactivity of the market is attributed largely to the pending changes in the tariff, and dealers do not look for much improvement in orders from large manufacturing plants until it is settled. The supply of second-hand tools has increased somewhat, quite a number of tools being thrown on the market recently by manufacturers who have been throwing out some of their old tools and replacing them with new ones. The demand for second-hand tools that are in good condition continues fairly active.

Makers of malleable iron castings report an improvement in orders. In other branches of the foundry trade the situation remains about stationary. Foundries making light gray castings are fairly busy, but the demand for heavy castings is still light.

To provide funds to make a start on the project to build extensive general repair shops at Brewster, Ohio, for the Wheeling & Lake Erie Railroad, B. A. Worthington, receiver, has made application to the federal court for authority to issue $1,429,975 in receiver's certificates. Plans have been prepared to build shops at that point at an estimated cost of $2,000,000, but it is the intention to carry out only a portion of the work at present. The receiver proposes to use $750,000 of the funds asked for in erecting shops and a roundhouse at Brewster, and the remainder in repairs and improvements at various points on the railroad.

G. A. Armington has established a business at Wickliffe.

Ohio, under the name of the Armington Electric Hoist Company, and will place on the market a line of electric hoists, overhead trolley systems and man trolleys. A company to carry on the business will be incorporated under the above name.

The Searchlight Gas Company, incorporated with a capital stock of $50,000, has secured a site in Warren, Ohio, and will erect a plant 30 x 100 ft., of steel construction, for the manufacture of gas tanks for lamps for automobiles and other purposes and compressed and dissolved acetylene gas. The prime movers in the company are Herbert Watson and John S. Snyder of Pittsburgh.

The U. S. Automatic Company, recently formed at Amherst, Ohio, has started its new plant in operation for the manufacture of screw machine specialties, mostly for automobile work. W. H. Schibley is president and Arthur R. Purmort, formerly connected with the Cleveland office of Manning, Maxwell & Moore, vice-president and sales manager, his office being located in Cleveland at 8015 Cedar avenue.

The Warren Construction Company, Warren, Ohio, has leased the foundry building formerly occupied by the Warren Brass Company and will use it as a construction shop.

The City Council of Canal Dover, Ohio, has authorized the Board of Public Service to build a municipal lighting plant. Estimates provide for a plant to cost about $35,000, exclusive of the building.

The Enameled Pipe & Engineering Company, Cleveland, has secured a contract from the Grape Products Company, North East, Pa., to equip its plant with large tanks for storing grape juice. The contract amounts to about $250,000. The new plant of the Enameled Pipe & Engineering Company at Elyria, Ohio, is nearing completion and will be placed in operation in a few weeks. The company announces that it has enough work on hand to keep the plant busy for two years.

The Victoria Truck & Novelty Company, Mansfield, Ohio, has been incorporated, with a capitalization of $10,000, to manufacture a new patented combination truck. The company has secured a building for a plant and will begin operations soon. Officers have been elected as follows: President, A. J. Summerville; vice-president, A. S. Baker, treasurer, T. B. Jarvis; secretary and general manager, W. W. Pecht.

The business of the Sidney Tool Company, Sidney, Ohio, maker of woodworking machinery, has grown to such an extent that more room is needed and the company has decided to erect an addition to its plant 40 x 170 ft. The new building will be used as a wareroom, shipping room and paint shop.

The Inter-State Ice Company, Sandusky, Ohio, will soon begin the erection of an icemaking plant. The contract for building the plant has been let to the Great Lakes Engineering Company, Detroit, Mich.

The Loomis Brass Foundry Company, Akron, Ohio, which has been incorporated with a capitalization of $10,000, has purchased and will operate the foundry in that city that has been operated under the name of the Akron Brass & Metal Company.

The Fanner Mfg. Company, Cleveland, reports a decided improvement in orders during the past month and it is now running its plant at practically full capacity in all departments.

Philadelphia Machinery Market.

PHILADELPHIA, PA., March 16, 1909.

The market shows little indication of any immediate return of more active conditions, although some manufacturers feel a little more hopeful regarding the situation. There has been more inquiry from distant points, particularly from some of the railroads in the Middle West and in New England, and a few orders for special shop tools are reported. In this immediate vicinity business continues to drag. Trade in the anthracite mining district, which is quite an important user of tools and equipment, a good share of which business comes to the trade in this district, is stagnant, awaiting the outcome of the conferences between the miners and operators regarding the wage schedule, the present agreement terminating April 1. While a number of meetings have been held, no settlement of the question is yet in sight, the operators flatly refusing to recognize the union, which is one of the miners' principal demands.

Business transacted during the week has been confined to single tool propositions, buyers withholding purchases unless tools are needed for work in hand. Inquiries are not as heavy as they were, prospective purchasers being still disposed to keep out of the market until the situation becomes clearer. The whole market therefore is of a waiting character, although it is believed that as soon as something definite is known regarding the tariff, and the question of prices of raw materials as well as wages become adjusted, a resumption in buying will take place. Manufacturers report no real change in conditions; some of those building tools of a special nature have had a few more inquiries, but a small proportion of them originate in this territory.

The second-hand tool merchants still report quiet conditions. There is scattered day to day buying, confined largely to the smaller class of tools and equipment, but no business of importance has developed.

No particular improvement is to be noted in the boiler and engine trade. Several good sized propositions are being estimated upon, but contracts have not yet been closed. There is a fair amount of new business in boilers of the medium capacities, but the trade is still far from satisfactory.

No increase in the output of either steel or gray iron foundries is to be noted. The steel casting plants show no increase in production. Some of the gray iron foundries maintain a fair rate of production, although but a small proportion of the work can be traced to the machine tool builders.

W. Hunter, chief engineer Philadelphia & Reading Railroad Company, will receive bids at his office, 520 Reading Terminal, this city, until April 6 for work in connection with the elevation of tracks along Ninth street; under contract No. 20, materials for permanent tracks, Berks street to Broad street; under contract No. 36, fences, gates, &c., York and Norris street yards, Huntington street foot bridge, &c. Plans and specifications for the work desired may be obtained upon payment of a fee of $15 each, which is refunded upon their return.

The Board of Directors of the Consumers' Hygienic Ice Company, Union, N. J., will receive bids until March 13 for the erection and completion of a 200-ton ice plant. Plans and specifications may be obtained from Joseph D. Lugosch, architect, Union, N. J.

Conferences have been held between the engineers of the Pennsylvania Railroad and the Municipal Union Terminal Commission, Baltimore, Md., in reference to a proposed new terminal in that city. The plans include the abandonment of the Calvert Street Station, which will be used as a freight station. No authoritative announcement regarding the plans for the new station has yet been made.

Common Council of Millville, N. J., will receive proposals until April 2 for the material, labor and equipment for a sewage purification plant, plans regarding which may be obtained from the city clerk. Charles B. Neal is chairman of the committee having the matter in charge.

John R. Wiggins & Co., contractors, were awarded the contract for the 95 x 180 ft., three-story concrete factory building to be erected for John Wythe & Brother, Twelfth street and Washington avenue.

Councils of the city of Philadelphia have appropriated $600,000 out of an available $1,250,000 for harbor improvements, which has the approval of the necessary municipal authorities. The Department of Wharves, Docks and Ferries will go ahead at once with plans for the work to be done.

The Newton Machine Tool Works, Inc., considers the general situation in a more favorable light. Several moderate sized orders have been taken for tools from railroads in New England and in the West, and more inquiries have recently been noted. Orders now represent about 50 per cent. of capacity, although shipments recently represented about 75 per cent. of capacity, this being due to a number of old orders being recently completed. The demand has been principally for heavy slab milling machines and cold saw cutting off machines, although orders for large gear cutters, for steam shovel gears and heavy railroad drills are to be noted. An order for a heavy portable boring machine for export was also recently taken.

The Link-Belt Company reports quite a fair amount of new business, including orders for a number of conveyor outfits for shipment to Cuba, phosphate handling machinery for the South, coal handling machinery for Nova Scotia and for New England parties, coke and coal conveyors, machinery for elevating and conveying refuse, car haul machinery, chip conveyors, elevators for handling crushed stone, &c., the principal delivery points being Pennsylvania, New York, Virginia and several of the New England and Southern States. A good volume of new business is also under consideration.

Milwaukee Machinery Market.

MILWAUKEE, WIS., March 16, 1909.

A significant condition here at present is the fact that builders of machinery, as well as agencies and dealers, are chary about permitting details of contracts to be published, assigning as their reason that many of the deals recently closed mark the beginning of material additions to equipment which will be made in the near future and it is deemed inadvisable to call attention of competitors specifically to these opportunities. Privately, however, enough information is given to indicate continued growth of trade. One noteworthy feature is the broadening market in the Northwest, where more actual business is now being closed than at any time within two years past. Much of this results from large

public or quasi-public enterprises recently undertaken, but part of it is due to greater industrial development, to the founding of new towns along the railroad extensions and to the cumulative demand for material which necessarily follows in their wake.

Building operations here have become so active as to give rise to numerous reports, having no foundation in fact, with which the daily press is filled. One of these, that has been spread broadcast, concerns plans alleged to have been made by the Allis-Chalmers Company for adding a forging shop and two machine shops to its West Allis works. Officials of the company state that no extensions of this character are contemplated for the immediate future; their only basis lies in the policy of ultimately concentrating here all of the work now carried on at other plants. It will be some years yet before that can be done.

There is a demand here for manufacturing sites. Two large companies, one of which requires about 20 acres, are now looking for suitable locations, and sales of several others have recently been closed. Among plants projected is a new plate mill.

The Waterloo (Iowa) Gasoline Engine Company, having increased its capital stock from $100,000 to $200,000, will build a foundry addition of considerable size.

The Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., is in the market for 70-lb. T-rails for 4 miles of new track.

Sterr Bros., Knowles, Wis., are reported to contemplate erecting an electric light and power plant.

The Milwaukee Boiler Company has received an order for two 100-hp. boilers from the Interior Woodwork Company of this city.

Steel bridges will be built by the city of Fond du Lac at Forest avenue and West Division street. The Board of Public Works has been instructed to prepare plans and advertise for bids.

A turbine and steam engine driven pumping system for the deep wells will be installed by the city of Platteville, Wis. Bids will be received until April 2. W. C. Kirchoff, engineer, Madison, has the specifications.

The Sight Feed Oil Pump Company, Milwaukee, will build a new factory, 140 x 200 ft., largely increasing its present capacity.

The Turner Oil Filter Company, Niles, Mich., in writing to an engine building concern here, states that orders booked since January 1 indicate an increased power development of close to 200,000 hp.

The O. L. Packard Machine Company reports that if the ratio of improvement this month continues equal to that of last, April will see its business about what it was before the depression.

The Heyl-Patterson Company, Pittsburgh, Pa., has been awarded contract for a 450-ft. unloading bridge to be built by the Northwestern Fuel Company at Superior, Wis.

H. H. Jensen, Milwaukee, has invented a machine for severing metal bars by twisting.

The property of the Iron Range Mining Company near Benton, Wis., consisting of a 125-ton concentrating plant, hoists, pumps, mine equipments, &c., will, it is reported, be sold at public aution April 8.

S. T. Lewis, Milwaukee, has been granted a patent on a variable speed gearing.

On March 20 contracts will be let for the H. W. Johns-Manville Company's new Milwaukee plant. For driving the machinery about 750 hp. in electric motors will be required.

G. A. Tomlinson, Duluth, has bought from the Underfeed Stoker Company six Jones stokers for use on the iron ore carrier Hoover & Mason, as a result of a successful trial made on one of his other boats.

For the sale of power and rolling mill engines the Filer & Stowell Company, Milwaukee, has appointed as agent Jas. E. McNary, Pittsburgh. His office is in the Machesney Building.

The Stevens Point (Wis.) Power Company is installing an alternating current generator of the Gregory Electric Company's build.

The Milwaukee Metal Stamping Company has rented a plant on St. Paul avenue and will enlarge its output.

At the Milwaukee Automobile Show the Wallman Mfg. Company has been exhibiting a very compact convenient type of storage tank and pump for gasoline to be kept beneath the ground. The entire show has been a marked success.

Aug. Jeske has taken out a permit for the erection of a brass foundry between Thirtieth street and the Chicago, Milwaukee & St. Paul Railroad tracks.

The National Blower Company, Milwaukee, is increasing its facilities and has added the office of second vice-president to its authorized directory. This company makes a feature of hot air heating and ventilating systems for foundries, such as is installed in the plant of the Falk Company here.

The Variable Speed Clutch Company, formed partly of the same interests that compose the A. O. Smith Company, has concluded arrangements to place on the market a new type of apparatus such as its name implies.

The car building and repair shops of the Great Northern Railroad, erection of which was begun at Superior over a year ago, will be completed and largely equipped this spring. Schmidt & Hill are reported to have the contract for the building. In the new plant both steel and wooden cars will be built.

The Mitchell Motor Car Company, Racine, Wis., finds an enlargement of its plant necessary and it is reported that work on the addition will begin this summer.

Government Purchases.

WASHINGTON, D. C., March 16, 1909.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until April 3 for a 50-kw. generating set and accessories for the New Orleans Navy Yard.

The following bids were opened March 9 for machinery for the navy yards:

Class 81.—Four Pratt & Whitney engine lathes—Bidder 78, Fairbanks Company, New York, $1160; 156, Manning, Maxwell & Moore, New York, $1268; 192, Pratt & Whitney Company, Hartford, Conn., $1550.

Class 91.—Two triple plunger pumps—Bidder 24, Blake & Knowles Steam Pump Works, New York, $808; 40, R. B. Carter Company, New York, $783.50; 61, M. T. Davidson Company, Brooklyn, N. Y., $780; 87, Goulds Mfg. Company, Seneca Falls, N. Y., $572.50; 93, G. & W. Mfg. Company, New York, $698.50; 113, F. H. Hayes Machinery Company, Boston, Mass., $827.50, $735 and $750; 156, Manning, Maxwell & Moore, New York, $682.41; 174, National Electrical Supply Company, Washington, D. C., $747.50; 255, Vermilye & Power, New York, $672.50.

Class 111.—Six 5-kw. turbo generator sets with spare parts—Bidder 62, Dravo, Doyle & Co., Philadelphia, Pa., $5143.80; 88, General Electric Company, Schenectady, N. Y., $6360; 240, Terry Steam Turbine Company, New York, $3912.

Class 121.—Thirty motors—Bidder 58, Diehl Mfg. Company, Elizabethport, N. J., $15,072; 88, General Electric Company, Schenectady, N. Y., $14,675; 222, B. F. Sturtevant Company, Hyde Park, Mass., $16,301.85.

Class 183.—Five hydraulic jacks—Bidder 43, W. W. Clark & Son, Baltimore, Md., $372.35; 74, Eastern Supply Company, Baltimore, Md., $499; 76, G. S. Fowler, Washington, D. C., $366; 92, R. W. Geldart, New York, $438; 124, Joyce-Cridland Company, Dayton, Ohio, $324.60; 131, Knox & Brother, New York, $437.58; 138, James E. Lamble Company, Washington, D. C., $566.80; 156, Manning, Maxwell & Moore, New York, $463.65; 168, Montgomery & Co., New York, $370.60; 198, H. A. Rogers Company, New York, $445.25; 203, Rawles-Cobb Company, Boston, Mass., $364.90; 207, J. B. Roach, New York, $495.50.

Class 242.—Two 1-hp. motors—Bidder 34, G. S. Blakeslee & Co., New York, $90 and $105; 58, Diehl Mfg. Company, Elizabethport, N. J., $76.50; 88, General Electric Company, Schenectady, N. Y., $90; 114, Holtzer-Cabot Electric Company, Brookline, Mass., $150; 174, National Electrical Supply Company, Washington, D. C., $125; 220, Sprague Electric Company, New York, $87.50; 222, B. F. Sturtevant Company, Hyde Park, Mass., $95.50; 228, Slevens & Cole, Boston, Mass., $90; 254, Universal Supply Company, New York, $99; 278, White, Van Glahn & Co., New York, $150.

Class 244.—Two 1-hp. motors—Bidder 34, G. S. Blakeslee & Co., New York, $90 and $105; 58, Diehl Mfg. Company, Elizabethport, N. J., $77; 88, General Electric Company, Schenectady, N. Y., $90; 114, Holtzer-Cabot Electric Company, Brookline, Mass., $150; 174, National Electrical Supply Company, Washington, D. C., $125; 22, Sprague Electric Company, New York, $87.50; 222, B. F. Sturtevant Company, Hyde Park, Mass., $95.50; 228, Slevens & Cole, Boston, Mass., $90; 254, Universal Supply Company, New York, $99.

Class 246.—One 1-hp. motor—Bidder 34, G. S. Blakeslee & Co., New York, $90 and $105; 58, Diehl Mfg. Company, Elizabethport, N. J., $77; 88, General Electric Company, Schenectady, N. Y., $90; 114, Holtzer-Cabot Electric Company, Brookline, Mass., $150; 174, National Electrical Supply Company, Washington, D. C., $125; 220, Sprague Electric Company, New York, $87.50; 222, B. F. Sturtevant Company, Hyde Park, Mass., $95.50; 228, Slevens & Cole, Boston, Mass., $90; 254, Universal Supply Company, New York, $99.

Under bids opened February 10 for apparatus for an electrically operated siren at the Ahnapee Pier Head Range Light Station, Wisconsin, Fairbanks, Morse & Co., Chicago, Ill., have been awarded contract for the engines, $340, and dynamo, $73. George F. Rohm, Milwaukee, Wis., will furnish the motors at $72.75.

Bids were opened February 23 for two scotch boilers for light vessel No. 66, as follows:

Harlan & Hollingsworth Corporation, Wilmington, Del., $9341, accepted; Bath Iron Works, Ltd., Bath Maine, $9400; Hodge Boiler Works, Boston, Mass., $9550; Griscom-Spencer Company, New York City, $11,665; New York Shipbuilding Company, Camden, N. J., $11,775; Robb-Mumford Boiler Company, Boston, Mass., $11,608.

The following awards have been made for machinery for the navy yards, bids for which were opened October 27:

Hilles & Jones Company, Wilmington, Del., class 155, one punching and shearing machine, $2600.

H. B. Smith Machine Company, Smithville, N. J., class 156, one motor driven cut-off machine, $360.50.

Manning, Maxwell & Moore, New York, class 157, one automatic railroad cut-off saw, $490.

Oliver Machinery Company, New York, class 158, one beveled hand saw, $518; class 159, one improved jointing and facing machine, $254.

American Wood Working Machinery Company, Rochester, N. Y., class 160, one universal saw bend, $497; class 167, one band re-sawing machine, $1291.

Under bids opened January 12 for machinery for the navy yards, the Chicago Pneumatic Tool Company, New York, has been awarded class 131, one pneumatic drilling machine, $62; class 132, six pneumatic drilling machines, $399; class 134, three pneumatic drilling machines, $149.80; class 135, 17 pneumatic drilling machines, $828.20; class 136, seven pneumatic drilling machines, $338.60; class 137, 36 pneumatic drilling machines, $1549; class 138; 36 pneu-

matic drilling machines, $1402; class 139, seven pneumatic drilling machines, $2761; class 140, 30 pneumatic drilling machines, $721.45; class 141, seven pneumatic drilling machines, $411.80; class 142, eight pneumatic drilling machines, $512.

The following awards have been made for machinery for the navy yards, bids for which were opened January 19:

Cleveland Pneumatic Tool Company, Cleveland, Ohio, class 102, six pneumatic riveting and twelve pneumatic chipping hammers, $342; class 103, eight reversible air drills and two pneumatic holders-on, $366.

Excelsior Equipment Company, Pittsburgh, Pa., class 104, two valve reseaters, $325.

Western Electric Company, New York, class 106, one dynamo, $23.40.

Under bids opened February 9 for machinery for the navy yards, the General Electric Company, Schenectady, N. Y., has been awarded class 1, ammunition hoists and electric equipment, $59,575.

The following awards have been made for machinery for the navy yards, bids for which were opened February 23:

Hallidie Machinery Company, Seattle, Wash., class 1, one universal milling machine, $2300.

M. T. Davidson Company, Brooklyn, N. Y., class 131, pumps and condensers, $48,744.

Trade Publications.

Pumps.—Blake & Knowles Steam Pump Works, 115 Broadway, New York. Four bulletins. Bulletin BK-825 treats of vertical triplex power pumps in a number of types and shows standard machines up to a 10 x 12 in. single acting pump. The construction is briefly explained and lists of capacity given. A pressure regulator for controlling electrically operated pumps and automatic switches which control the pump by means of the variations of the level of the water in roof tanks or sump pits are illustrated. Bulletin BK-826 briefly describes vertical triplex power pumps of the double acting piston pattern and shows a number of machines up to a pump with a capacity of 41.36 gal. per rev. In bulletin BK-827 special artesian well pumps are shown in several types and an electric sinking pump is also illustrated. Ammonia pumps, both belt and steam driven, are briefly referred to in bulletin BK-828, and a standard machine is shown.

Air Compressors.—American Compressor & Pump Company, 26 Cortlandt street, New York. Home office, 718 East Pratt street, Baltimore, Md. Bulletin A. Many types of air compressors made by this company are shown, including a duplex steam two-stage air compressor, type A, and a type B duplex steam driven compressor, a single steam driven compressor and a belt two-stage compressor are shown. Some smaller equipment is illustrated and brief mention is made of air receivers and vacuum pumps.

Alternating Current Dynamos and Motors.—James Clark, Jr., Electric Company, Louisville, Ky. Bulletin No. 36. Includes a view of the company's factory and sectional illustrations of dynamos and motors for alternating current, together with assembled machines briefly describing the various parts. Mention is made of the company's electrically driven sensitive drills, lathe center grinders, &c.

Canvas Belting.—American Belting Company, Youngstown, Ohio. Booklet. Devoted to the Alpha stitched canvas belting. Views of the company's plant are given and the method of constructing the belting is described. An endless belt in use for conveying coal is shown and belt lacing and canvas belt dressing is referred to. Price-lists are included, together with directions for ordering.

Grinding and Polishing Machinery and Speed Lathes.—J. G. Blount Company, Everett, Mass. Catalogue No. 12, 6 x 9 in., 46 pages. Shows grinding machines with self-oiling bearings, which are furnished with several grinding attachments in all the standard sizes. Wet tool grinding corundum wheels, combination grinding, polishing and buffing machines and machines made especially for buffing only are included in the book. Speed lathes, which are built with 11, 13 and 16 in. swing with beds from 3 to 12 ft. long, are illustrated and shown with various attachments. Special mention is made of manual training school lathes.

Die Castings.—Lumen Bearing Company, Buffalo, N. Y., and Toronto, Canada. Booklet, 3 x 6 in. Describes die castings of Lumen bronze which has a compressive strength of 80,000 lb., a tensile strength of 35,000 lb., and a torsional strength of 35,000 lb. per square inch. This metal, which is extensively used in cast form for journal bearings, is not confined to that use, being adapted to innumerable small parts, such as dating machines and telephone parts, but is not a substitute for stamped work.

Gas Engines and Producer Gas Plants.—Du Bois Iron Works, Du Bois, Pa. Catalogue, 6 x 9 in., 35 pages. Illustrations of the company's plant with a brief description of its facilities is given, and the Du Bois throttling single cylinder, tandem and twin tandem engines especially designed to operate on natural and illuminating gas are illustrated. The engines are designed with one, two and four cylinders to meet the conditions of every service, and the general features of construction are the same throughout. Standard machines assembled and in parts are shown, together with sectional views, and the construction of the apparatus is graphically described. Producer gas plants of the suction or pressure type are illustrated in the same manner, and diagrammatic elevations of a complete gas power plant and a complete engine plant are shown, with comparisons of heat evolution, dissipation and transformation.

Firebrick.—Harbison-Walker Refractories Company, Pittsburgh, Pa. Catalogue, 4 x 6¾ in., 158 pages, leather bound. Issued in the style and size of the well-known engineering handbooks. This volume treats with completeness of silica, magnesia, chrome and fireclay brick and various refractories as produced at the above company's works, which have a capacity of 1,100,000 brick daily. The numerous illustrations given are from the drawings of owners or patentees of various forms of metallurgical furnaces. Hot blast stoves, open hearth furnaces, gas heating furnaces and coke ovens of different construction, particularly retort ovens, are shown in detail. In connection with the text on magnesia and chrome brick, &c., data are given as to the composition of these refractories and their adaptation to various parts of the construction of open hearth, puddling and heating furnaces and copper reverberatories. Valuable features of the catalogue are tables showing how a circle or arch of any diameter may be laid up with a combination of the standard size firebrick. The standard shapes are illustrated in colors and the adaptations of the various shapes explained. Particular reference is made to the East Chicago works of the company, the last to be built, and which supply the trade in Indiana, Illinois, Michigan, Wisconsin and farther Western States, the East Chicago brand being known as "W. Star."

Steam Plant Equipment.—Morigrieve Engineering Company, Perth Amboy, N. J. Two bulletins and circular. Bulletin No. 1 shows the Grieve safety device for jet condensers, which prevents water from being drawn back into the engine cylinders and can be applied to any existing condensing equipment. Bulletin No. 2 describes the A. M. C. elastic metallic packing for ammonia compressors, air compressors, pumps, &c., and the circular shows the Angell steam trap made by the company.

Cast Iron Culverts.—Isham-Miller Company, Butternut, Mich. Booklet. This is a sectional expanded corrugated cast iron culvert for highways, railroads, parks, &c. A section of the culvert is shown over which a 16,000-lb. traction engine was run without damaging the culvert. An installation of the culvert is shown and some testimonials are included.

Engines and Boilers.—Atlas Engine Works, Indianapolis, Ind. Catalogue, 8 x 10½ in., 93 pages. This is a general catalogue of the company's products, which include Corliss engines, inclosed high-speed engines, heavy duty engines, automatic self-contained engines, gas and gasoline engines, water tube boilers, horizontal tubular boilers, fire fronts, smoke connections, locomotive boilers, and portable engines and boilers. Some useful information on steam engineering is given.

Marine Gasoline Engines and Equipment.—Ferro Machine & Foundry Company, Cleveland, Ohio. This is a 71-page volume, 9¼ x 12 in., entitled "Practical Treatise on Correct Design, Construction, Installation and Operation of Power Boats." The actual workings of marine gasoline engines are exhaustively explained in non-technical terms and various parts of the equipment are taken up and described. Methods of installing plants are given and directions for assembling the power equipment are included. The volume is well illustrated.

Concrete Reinforcing Material.—General Fireproofing Company, Youngstown, Ohio. Catalogue, 6 x 9 in., 47 pages. Concrete reinforcing material in the shape of steel bars, expanded metal and wire fabric reinforcement is illustrated in a number of styles, and the book contains some interesting views of construction work in which the company's material has been utilized. Some useful tables relating to the use of steel and concrete reinforcing are given, together with data on wire fabric reinforcing.

Tool Steels and Forgings.—McInnes Steel Company, Corry, Pa. Booklet. Lists a number of different grades of high speed steel made by the company, together with tool steel disks, &c. Tables of weights of bar steel are given.

Machine Tools.—Hill-Clarke & Co., Boston, Mass. Circular. Illustrates a universal horizontal boring machine which is being demonstrated at the company's office and warerooms at 156 Oliver street, Boston, Mass. A number of other machine tools which are being shown in the demonstration shop are briefly described.

Sluice Gates.—Chapman Valve Mfg. Company, Indian Orchard, Mass. Bulletin No. 2. Sluice gates designed for use in reservoirs, filter beds, &c., are shown. They can be operated by hand, hydraulic cylinder or electric motor, and several types of operating equipment are illustrated. The standard types of gates and stands are shown, with the aid of line drawings and a number of dimension sheets of sluice gates are included.

Automobiles.—George N. Pierce Company, Buffalo, N. Y. Catalogue. Size 10 x 12 in., 72 pages. Illustrates and describes the factories in which the Great Arrow cars are made. A number of medals and prizes won by cars of this make are shown.

HARDWARE

MANUFACTURERS of specialties or novelties which are seeking a place in the market have often been driven to introducing the goods by canvassing the public at large or the particular class for whom the new articles are designed. This is because of the difficulty experienced in inducing wholesale or even retail merchants to buy the goods and bring them to the attention of their customers. Unless, therefore, the article is to remain unknown it must in many cases be introduced by canvassing the consumers. When a demand is thus created the wholesale and retail merchants are ready to take hold. It is, however, a very different matter when manufacturers of well-known articles or leading lines attempt to market their products directly to the public without making use of the regular channels of distribution. For such efforts on their part there is no such justification, and of the unsatisfactory working of such efforts there are many instances in the recent history of the Hardware trade, as the policy of canvassing to the consumer has been abandoned because too expensive and for other reasons unprofitable. The course of things in the past, as referred to in the following paragraphs, should relieve merchants who are apprehending the effect of the campaign, which a prominent catalogue house is intending to institute by sending a multitude of canvassers among the farming population. It is not unlikely that it will be found a difficult and unprofitable venture.

The lightning rod and driven well canvassers of a generation ago made their profits out of the frauds that they perpetrated on their customers, and when people became familiar with their methods the "business" died out because the legitimate profit was not sufficient to cover the expense of personal canvassing. The "trailers" who sold Buggies through the country 20 and 30 years ago followed more legitimate methods, but their business did not last long as they could not compete in the long run with the more economical method of selling through regular merchants. A gifted salesman with a trailing wagon or van can sell cheap Buggies at good prices, because a bright new Buggy when rolled out on the grass in a farmer's yard presents the most beautiful sight in the world from the standpoint of a salesman, but the few men with the necessary talent to carry on this difficult work can earn more money and live more comfortably as salesmen in the wholesale trade, and there are only a few places in the United States where the business is continued at the present time.

For 20 years or more the harvesting machine manufacturers sold their goods chiefly through canvassers. They made contracts with retail merchants to act as their local agents, and paid retail commissions on each sale, but in most cases the orders were taken by canvassers, and the companies also furnished "experts" to set up and start the machines, and to repair any machine sold in previous years that broke down or gave trouble. This canvassing system grew out of the struggle of great and wealthy manufacturers to get trade during the period when their profits were large and the rival companies were engaged in a struggle for supremacy. The expense of maintaining their armies of canvassers was enormous, and they finally "got together" for the purpose of eliminating this and other expenses growing out of the system of canvassing, which had become a ruinous burden. There is probably no other line of agricultural trade which ever offered so inviting a field for legitimate canvassing as harvesting machines. The Twine Binder sold for about $125 and the Mower for $40 to $50, so that the cost of getting an order was chargeable against a comparatively large item in each sale, and it was not unusual for 100 machines to be sold in a season in the "territory" of one dealer. The fact that the harvesting machine manufacturers have abandoned the system after wrestling with it for a generation is pretty good evidence that canvassing as a method of selling any standard commodity is a very expensive and inefficient method of doing business, and does not compare in economy and general results with "regular" trade as conducted by established merchants.

Years ago the leading Sewing Machine manufacturers insisted upon selling their Machines through canvassers, and some of them still persist in that policy. The usual commission of a canvasser was $10 on a Machine, which was also the average cost of selling Harvesting Machines through canvassers. In the sale of Sewing Machines, as well as in Harvesters, there were other expenses that averaged a large figure against each Machine. When the important patents on Sewing Machines expired and the mail order houses were able to get Machines at a moderate profit over factory cost, they exploited the opportunity to the utmost, and, in fact, made their first great success. In selling Sewing Machines by mail they were competing with the expensive canvassing system of the old line manufacturers, and not, as they have so widely claimed, with the merchants.

The Bicycle manufacturers endeavored for many years to maintain their retail prices at figures three or four or five times the factory cost, and each manufacturer tried to sell his product through his own stores or exclusive agencies and canvassers, instead of utilizing the economical channels of the regular Hardware trade to market the product. Millions of dollars were expended to subsidize racing and other developments of the Bicycle as a sport, and thus make the Wheel fashionable and popular by artificial methods instead of selling the goods in an economical manner. When the old system collapsed, through overproduction, one catalogue house sold thousands of Wheels in one season, at prices which can now be met by any retail merchant for a Bicycle of the same grade. If some Hardware jobber doing a national business had possessed the foresight, he might have done, in the case of both the Sewing Machine and the Bicycle, what was done by the mail order houses, by supplying these goods to Hardware merchants at prices based upon the cost of manufacture. In the course of years many of the jobbers did rise to the occasion, and any Hardware merchant can now meet mail order competition in these and a thousand other commodities. It so happened that the mail order houses got there first, not in competition with merchants, but in competition with manufacturers, who had arbitrarily persisted in selling their product through canvassers and other agencies that are not economical means of reaching the consumer.

Hardware merchants need not be seriously alarmed at the reports that some of the large mail order houses

propose to employ armies of canvassers to solicit trade from the farmers. It is a somewhat startling innovation for these houses to abandon the alleged economy on which their business has always been conducted, and go to the other extreme of personal canvassing, which has proved the most expensive way to market any commodity. While their plans are bold and plausible it is extremely doubtful whether they can realize in actual practice a theory which may look attractive on paper, especially as in other lines it has been tried and found wanting. The art of canvassing the farmer has been decadent for several years, and the proposed revival of the practice, with all the modern ideas and ingenious devices of the art, may afford an interesting and perhaps entertaining study to merchants who can take a philosophical view of it and await the final results with complacency.

Condition of Trade.

Whatever may be said in regard to the market, the uncertainty and disturbance which characterize it and the ebb and flow of demand, it feels the effect of the beneficent forces of nature, which are working constantly for the improvement of the situation and the stimulating of movement and enterprise in commercial and industrial fields. The growing crops have promise of another harvest, which will, it may be hoped, add greatly to the wealth of the country. The coming of spring summons to manifold activities, and agricultural tools and seasonable goods in general are called into requisition. At the same time there is an opportunity for outdoor work along many lines, and building and other enterprises demanding the expenditure of money and causing movement of merchandise are again receiving attention. Even what may be regarded as the destructive forces of nature, fire and flood, and the resistless wearing out of things that necessitates renewal or replacing, are all helping along the good work and giving trade to merchants and occupation to the mills and factories. In estimating the influences which tend toward the return of normal prosperity, these natural and unceasing forces are co-operating with the adjustment which is taking place in finances and trade, as disturbance is being quieted and confidence restored, with a more or less complete renewal of business activity. The discussions in regard to the tariff and the reasonable expectation that values in many lines are to be lower continue to reduce the volume of business below what it would be in view of the splendidly sound condition of the country as a whole. A marked feature of the situation is the absolute absence of speculation, there being no disposition on the part of merchants or manufacturers to place orders for goods or material beyond their early requirements. Fortunately, with this reasonable conservatism there is also more readiness than is often found in a market that is expected to decline to make purchases sufficient to keep things moving in factory and store. The production of goods accordingly goes on and the stocks of merchants are constantly being replenished. In both the producing and distributing fields there is care to avoid overbuying, so that when a decline occurs there will not be necessity for marking down any considerable quantity of the commodity affected. The course of business the last few months emphasizes the contrast which has been evident during the period of depression between the conditions which prevail in the manufacturing sections of the country and those which prevail in the agricultural States. At the present time there is a good deal of complaint of slow and reluctant business in the East, while in the West there is much more free movement of merchandise and merchants, wholesale and retail, are doing a fair though not heavy business.

Chicago.

Instead of the radical changes and widespread disturbance of values in the more highly finished lines of Iron and Steel which was feared might follow the recent decisive slump in prices of rolling mill products, there has been, all things considered, a remarkable degree of steadiness in Hardware lines. Even the danger of disruption which threatened to thwart efforts being made to maintain the existing schedule of prices on Wire and Wire products seems, for the present at least, to have been averted, since it is reported that the cut in prices made by an important mill interest have been withdrawn; the unevenness in jobbers' prices on Wire Nails has also practically disappeared. As a result, this section of the market has up to the present time withstood all efforts to dislodge it from the established level, and specifications for Wire Nails and Fencing for the spring trade are coming out fairly well. While hopes for the rapid improvement of trade, which were entertained at the beginning of the year, have not been fully realized, there is, nevertheless, a better volume of business moving in many Hardware lines than was the case at this time last year. There will, doubtless, be more or less readjustment of values in goods intimately connected with or related to the various Iron and Steel products the prices of which have been cut, but in most cases it is believed that such action has been anticipated by prior reductions in finished goods, so that radical revision is not generally looked for. Conditions are just now too much unsettled, however, to expect an increase of stock orders, and it is probable that until a more settled basis is reached buyers will continue the policy of restricting purchases to nearby requirements. The most encouraging feature observed at the present time is the large amount of prospective building in sight, as reflected by the large increase in building permits taken out in Western cities during the month of February. The indications are that, barring unforeseen complications, the present year will develop a large amount of building construction which cannot fail to exert a stimulating influence upon some of the leading Hardware lines. Even now the demand for Builders' Hardware is fairly good, and it may be said, indeed, that there is less complaint as to volume than the closeness of prices which characterize transactions in these goods.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—A business man whom the writer recently saw referred to an article he had just read, as follows: "One of the most surprising things about this world of ours is the amount of genuine unselfish goodness that there is in it." President Taft recently said: "I pray that it may be given to me to obliterate all sectional lines, and leave nothing of difference between the North, South, East and West save a friendly emulation for the benefit of our common country."

The person referred to, and many others, are interested in the men appointed by President Taft for the new Cabinet. All but two members of this Cabinet have been prominent lawyers in this country, two of them Democrats; and these persons willing to accept positions for the benefit of the United States practically are losing large amounts of money. As an illustration, Philander C. Knox's business as a lawyer, it is stated, had brought him in $100,000 a year, and the salary he receives is cut down to $8000 a year, while all the others are getting many thousand dollars less than their business would have brought them. As a further illustration, Franklin MacVeagh of Chicago, was compelled to give up a very large business in order to accept a position in the Cabinet; and it is thought by many that there were never better men in these positions or who would give more intelligent efforts to aid the country.

If the conditions of trade were dependent only upon financial conditions it is quite likely trade would have increased very much throughout the entire country with-

in the last six months. It is very evident that the various railroads have looked forward to additional work and they have extended their interests by placing contracts for many thousands of tons of Steel Rails for this year's delivery, and have given orders for thousands of railroad cars. Some reductions in prices may have urged them to give these orders earlier in the year than they otherwise would, but throughout the entire country the financial conditions are considered as largely improved within the last six months.

Many manufacturers state that considerable discussion in regard to a change in the tariff is found among buyers of all kinds of goods. Some manufacturers are not yet confident that nothing will occur in the tariff business which will be injurious to them. It is understood, however, that this matter has been investigated for some months by the members of Congress, so when it is brought before them by the new President it is thought they will be pretty well prepared to act in accordance with the necessities of the United States, as well as to the advantage of the inhabitants. It is generally thought that not only the President but all the members of Congress will work as quickly as possible to give proper attention to it.

Unfortunately a feeling has existed in the coal mining districts that the trouble between the owners and the workmen may end in a strike, and this has affected trade somewhat. It is unfortunate that the agreement made six years ago and renewed three years ago was not continued for at least three years longer, owing to the present conditions of the country. It has been published that the operators are willing to follow this procedure, but if there is a suspension of work in the mines they say that the coal now stored in many yards is sufficient to prevent a coal famine during the entire summer or fall months.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—We hear rumors of a letting up in business since the first of March, but we are glad to be able to report that business with us is quite satisfactory and showing a substantial increase over last year. February was an unusually good month and March promises to be better.

There is, of course, no speculation in the market. The trade is buying for its immediate needs. Retail dealers in the agricultural sections tributary to St. Louis seem to be enjoying a good, seasonable trade judging by their orders. The situation has been helped by general rains throughout the Southwest, where moisture was badly needed.

The feature of trade for the past 30 days has been the number of new stock orders placed in this market, a large proportion of these new stocks going into the West and Southwest.

Another indication that retail business in our territory is on a satisfactory basis is in the fact that our mail orders direct from customers—while never large—have been unusually numerous this season. This increase in mail order business probably results from the fact that dealers—even the very large retail merchants—are buying carefully and conservatively and are filling up the frequent gaps in their stocks by mail orders instead of buying large quantities either from jobbers or direct from the manufacturers.

In going over the comparative features of last year it was gratifying to note that our mail order department at least showed an increase in sales over the year before. This goes to show that in a bad year merchants allow their stocks to run down very close, making it necessary, at the slightest pressure of business, to order goods immediately by mail instead of waiting for salesmen.

Recent developments in the Nail and Wire situation have been, to say the least, interesting. This company for a period of two weeks made some very low prices on Nails and Wire, both from stock and in carload lots, to be shipped direct from the mills. It seemed for a while we were upon the eve of a general decline in these commodities. The large interests in these lines prevailed upon us, for the common welfare, to restore our prices. We wonder if our jobbing friends, especially in this territory, appreciate our self-sacrifice in relinquishing, for the general good, a very attractive position in the Nail and Wire market.

During this period we were snowed under with inquiries for quotations on carload lots. We regret to say some of the retail merchants to whom we quoted these special prices, instead of considering them confidential, promptly gave us away to competing jobbers and to manufacturers of Nails and Wire. In a number of instances we heard of our quotations, through competitors, a day or two before we received the orders from the dealers to whom we had quoted prices.

We are tempted to write a little sermon to retail merchants upon the propriety of protecting the house that quotes them an inside price. Our experience would lead us to believe no such protection exists in the case of the average retail merchant. It would seem retail merchants would learn the lesson, which has long ago been learned by jobbers, and that is, when they receive a special price it is a good idea to consider this special price confidential not only to protect the seller but also to protect themselves, because as soon as the price becomes known to other salesmen the market is immediately demoralized and your competitor, through these other salesmen, will receive the same low price you have enjoyed. So in giving away a low price you not only are unjust to the parties who have made you this price, but you put your competitor in position to obtain the same concession, thereby relinquishing any advantage, in a competitive way, you might have enjoyed from the special price.

It was also interesting to note that immediately after prices were restored a lot of retail merchants suddenly decided they needed a car or two of Nails and Wire, and we were placed in the disagreeable and unpleasant position of being compelled to decline orders which a few days before we would have been glad to accept.

Recent Nail history is particularly curious in light of the fact that a threatened fight between the Steel Corporation and the Independents, instead of demoralizing the market actually had the effect of making the situation stronger than it was before the demonstrations of hostilities.

Cleveland.

W. BINGHAM COMPANY.—"Confidence the keystone of all business," we notice is prominently placarded on all "prosperity roads" throughout our country. Since the inauguration of President Taft business of all kinds has taken a new impetus, and we believe that the recommendations that our President has made and will make to Congress are such that their future deliberations will be such as to inspire in the hearts of all business men the idea that they can look forward to the coming months of this year with a feeling that all will be right, for it looks very much to those who have been up in the trees that the tariff legislation, which has been a bugbear to business for the last six months, will now be settled on correct lines.

The loud talk of the great reduction in prices of steel products has had its effect on business, and we believe that the merchants of our country will now settle down and feel that a safe, conservative policy is going to be pursued by all of our leading manufacturers in the production. pricing and distribution of their output, so that the trade can feel that they can make their purchases for the present as well as for their wants in the near future on a basis that will warrant them a profit in handling same.

There is one thing quite sure, and that is the country merchants in many lines of goods have been quite conservative in buying for the last six months, and with the advent of spring trade they must of necessity sort up their stocks quite liberally, and they will find that the leading Hardware jobbers throughout the country have their stocks well assorted, and can and will look after the wants of their customers in a prompt manner, and at prices that will be interesting.

It is said that variety is the spice of life. Well, certainly, the jobbing Hardware line is composed of a great variety of articles. In looking over our stock sheets we find that in one article alone, Wrenches, we have in stock 37 kinds, comprising 259 different sizes. Of Auger Bit Braces we carry in stock 16 kinds and 55 sizes.

So it goes right through on the different lines of manufactured Hardware, in order to meet the wants of our many and varied customers throughout the different States. The Cleveland Hardware jobbers are prepared now, as they have been in years past, to take care of the wants of their customers in the many varied lines of Hardware to a greater extent than can be found in many other markets.

Trade in the general Hardware line at the present time is quite satisfactory, and the number of inquiries we are receiving by mail from our many friends in the trade, and the quick responses that we get from many of our quotations, indicate that trade and traffic will be largely increased over past months, and we certainly look into the near future with a feeling of hopefulness in regard to business. We have no complaints to enter and we record with thankfulness the many favors in the way of orders we are receiving at the hands of our many friends.

Spring goods of all kinds are going forward in good volume. Orders for fall shipment of goods are now being entered, covering Lanterns, Axes, Crosscut Saws, Buck Saws, Stove Pipe Elbows, Coal Hods, Stove Boards and many other kindred goods.

The large number of orders we are receiving for Builders' Hardware indicate that many jobs that were in contemplation have been held on the suspense list for a few months past, and that there is going to be a large amount of building done. We have always made a specialty in this line of goods through our many intelligent customers throughout the country, and we feel that our efforts in that direction are appreciated and we are reaping the benefit of same.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—Trade conditions in the Trans-Missouri region are normal and satisfactory. All indications point to an excellent demand for goods as the season advances, with prospects for a large trade during the coming spring months.

At this season of the year pleasant and stormy days follow each other closely, which will probably represent the weather conditions until about May 1. Agriculturists are taking prompt advantage of every favorable opportunity to make preparations for the necessary field work.

A copious supply of moisture throughout the corn belt has placed the soil in admirable condition for the reception of seed grain, so that general conditions as they exist at the present time could not be materially improved. The satisfactory volume of business now being transacted warrants the conclusion that a still heavier trade will develop just as soon as the weather settles and permits outdoor work of all kinds to proceed uninterruptedly.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—While there is nothing exciting about business at present, no eager buying to stimulate prices, still there is a widespread, steady demand for such tools, implements and constructive Hardware as go to make up a good daily volume. Comparisons, to be of any value, are not to be made with last year's records, but with the year before. Last year was a sort of sabbatical year, or *annus non*. To be sure, we survived it. There were singularly few commercial failures of importance, but it was a time when the zigzag on the cross barred chart went down into the valley among the shadows.

And this reminds us of the very interesting chart which *The Iron Age*, with commendable enterprise, put forth of the prices of leading articles in iron and steel for the past 10 years. Not since 1900 have there been any tall peaks reaching into the upper regions. The fluctuations, meanwhile, although interesting in themselves, have been comparatively small. In this we see the influence of the controlling hand of the great steel interest.

Another marked feature is the absolutely horizontal line of the prices on steel rails from 1901 on. The variation is not inconsiderable from '99 to the latter part of 1900, then a plunge, a rise, and then absolute inflexibility—a road as straight as the Appian Way. Will it remain so for the coming years? Possibly before we get through with the present tariff we will have something to observe on this score. It is a marvel that the controlling interest does not see that in depriving its best customers, the railroads, of the benefit of the market they are doing them a great injustice.

If the price of Rails were down proportionately the railroads would doubtless be free buyers, and that would mean hundreds and thousands of men at work laying these same Rails, using Spikes, Bolts and Fish Bars strengthening and renewing bridges, grading the hills and valleys, moving earth, if not heaven and earth, in making their extensions, sidings, &c. All of this work which might be going on is tied up by reason of inexorable agreement. It seems singular that this is not at once apparent to the manufacturers and that large Rails should share in the market fluctuations with the small ones.

We still believe it may come to be and that a new era in activity and prosperity will be ushered in with Rails in the neighborhood of $20.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business continues to be fairly good. It is considerably better than it was at this time last year, but it is not yet up to the volume of 1907. In the exclusive agricultural sections trade is best. In the timber districts business is not so good, as the lumber industry is slow in reviving. In the mining sections of the South, the volume of business is also curtailed, but both the mining and lumber districts are slowly beginning to operate again, and we think by summer these two important lines will be in much better shape.

The tariff agitation and the widely published newspaper articles that the United States Steel Corporation was recklessly reducing prices on all of its products has had the effect of giving a setback to the trade, and we think unnecessarily so. We don't believe the tariff question will interfere with business, and it no doubt will be settled in the near future, and the United States Steel Corporation has not made a general reduction in prices, and claims that it will not.

Collections for the month of February were very satisfactory.

Boston.

BIGELOW & DOWSE COMPANY.—Weather conditions have had an influence in retarding business improvement and some dealers complain of poor trade and slow collections. On the other hand, manufacturing interests are preparing for a period of prosperity. A dealer in cotton machinery the past week informed the writer that he had secured an order that day for $100,000 and that he had about closed another order for $600,000.

Many manufacturing plants that have been idle for several years have been sold for immediate improvement. As soon as the people can form some idea of the future tariff legislation the money and the plans are ready for immediate development.

People will be impatient if Congress makes unnecessary delay at an estimated loss of $10,000,000 for each day. Iron and steel used in manufacturing Hardware may be reduced in value, but the cost of the raw material is so small as compared with the labor that no radical change will be made in Hardware values until the price paid for labor is reduced. Some carload orders for Wire Nails and Fencing were cancelled when the first news came of a break in the price of Steel products, but finding the prices were not reduced the orders were reaffirmed.

The volume of seasonable goods for spring delivery differs but little from former years. Give us settled weather and sunshine and everything will move along merrily.

The New England Hardware Association has just closed a most successful convention at Springfield. All New England was represented and the management received the highest commendation for the careful arrangements that insured all a good time.

NOTES ON PRICES.

Wire Nails.—The market for Wire Nails, Barb Wire, &c., continues remarkably regular and in striking contrast to the conditions which prevail in other iron products. The policy which the manufacturers are pursuing of making no change in price at this time meets with the cordial approval of the trade, who are thus given an opportunity to dispose of stocks on hand and of keeping their assortments down to as small quantities as they may think advisable. Notwithstanding the caution which is exercised in buying there is, however, a fair movement of business, and the mills, while not occupied to their full capacity, and while in some cases they could very comfortably take care of much more business, report a gratifying demand in view of all the conditions. It is hoped that nothing will occur while the spring trade is in progress to disturb the general evenness of prices which now prevails, but the situation is not without its uncertainty, for if any manufacturers of importance in the market should endeavor to secure business by making cut prices it would probably lead to similar and deeper cuts by other manufacturers, so that the result would be an open break. At the present time, however, things seem to be moving along smoothly with a desire on the part of manufacturers to maintain values, and the jobbing trade evincing a disposition to co-operate with them in this effort. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.95
Carload lots to retail merchants	2.00
Less than carloads to jobbers	2.00
Less than carloads to retail merchants	2.10

New York.—Local demand is of moderate proportions, but Nails are constantly going from store in small lots. Retailers are deterred from placing orders for carloads of Nails from lack of confidence in the future stability of the market. The base price of $2.25 per keg for small lots at store is regarded as being fairly well maintained.

Chicago.—The volume of trade is not up to expectations, yet considering the adverse influences that have for some weeks unsettled the market, it is, on the whole, fairly satisfactory. Buyers are naturally estimating their requirements conservatively, but the average daily business of the leading interest for the past week indicates the existence of a well sustained consumptive demand. The trade generally seems to be in accord with price maintenance policy, which thus far has preserved the regular schedule from disruption. Prices are reported as being generally upheld, though absolute uniformity in this respect is broken by the slight shading of a few interests of minor importance. Quotations are as follows: $2.13 in car lots to jobbers, and $2.18 in carlots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The flurry in the Wire Nail market caused by the action of an interest in shading prices 10 cents per keg is about over, this concern having withdrawn this price and is now said to be adhering rigidly to the regular price. Wire Nails are practically the only item on the whole list that has not suffered an official reduction in prices, and it is stated that leading makers, such as American Steel & Wire Company, Pittsburgh Steel Company and Youngstown Sheet & Tube Company, are absolutely maintaining regular prices. The trade is still buying Nails conservatively, not knowing how soon conditions may change, but at the same time there is the assurance by the leading interests that a determined effort will be made to maintain the Wire Nail market on its present basis. Under existing conditions it is but natural that demand should be light and confined almost entirely to small lots for actual needs. Wire Nails are quoted in carloads to jobbers at the base price of $1.95, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days, with the regular advances for less than carloads to jobbers, and for carloads and less than carloads to merchants.

Cut Nails.—With the approach of the time when active building operations will commence an improved demand is looked for. At present business is light and confined to small lots. Steel Cut Nails are regularly quoted at $1.80 base, per keg, f.o.b. Pittsburgh, for carloads, but on desirable orders this price continues to be shaded from 5 to 10 cents. Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western markets, but in the East this differential is not observed.

New York.—There is comparatively little being done in the local market, as requirements for Cut Nails are light. In small lots at store Nails are held on the basis of $2.05 per keg.

Chicago.—The demand continues light, with perhaps a slight tendency toward improvement. Conditions are not at present favorable to a marked increase in buying, though the position of the mills is strengthened by the decreased cost of raw material. Regular quotations, which are subject to some shading, are as follows: In carload lots, to jobbers, Iron Cut Nails, $2.08; Steel Cut Nails, $1.98.

Pittsburgh.—Demand continues light, and is almost entirely for small lots to meet current needs. The tone of the Cut Nail market in sympathy with Wire Nails is reported as a little firmer, and it is believed demand will materially improve when active building operations are started. Regular quotations, which are said to be fairly well maintained, are as follows: Steel Cut Nails, $1.80, base, per keg, f.o.b. Pittsburgh, for carloads, but this price continues to be shaded from 5 to 10 cents on desirable orders. In the Western markets Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

Barb Wire.—The uncertainty in regard to the market has had a tendency to keep orders down to actual requirements, and only a moderate business is doing. Regular quotations are on the following basis, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.10	$2.40
Retailers, carload lots	2.15	2.45
Retailers, less than carload lots	2.25	2.55

Chicago.—In spite of the conflicting reports regarding the stability of prices some improvement in the demand for Barb Wire is noted. Orders are not coming out as freely as they should at this season of the year, but the actual requirements of consumers are counted on to produce a fair volume of business. Quotations are as follows: Jobbers, Chicago, car lots, Painted, $2.28; Galvanized, $2.58; to retailers, car lots, Painted, $2.33; Galvanized, $2.63; retailers, less than car lots, Painted, $2.45; Galvanized, $2.75; Staples, bright, in car lots, $2.25; Galvanized, $2.55; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The uncertainty as to what action may be taken in regard to prices on Barb Wire is no doubt holding back a good deal of business, and new demand is entirely for small lots for actual needs, jobbers and consumers desiring to keep stocks as low as possible until the future course of the market is assured. When this is known, it is believed that demand will show material betterment. Regular quotations are on the basis of $2.10, for Painted, and $2.40, for Galvanized, to jobbers, in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, with the usual advances to retailers in carload and less than carload lots.

Plain Wire.—Business is confined to small lots and limited demand, with prospects of little change in trade conditions until confidence in the permanent stability of the market is established in the minds of buyers. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of $1.80 for Plain, and $2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—Conditions are practically unchanged since last report, save that the disquieting rumors of an impending break in prices has failed of confirmation. The prospects for a good trade in Woven Wire Fencing are said to be quite promising. Manufacturers are ordering

and specifying to meet only current needs. We quote as follows: Car lots to jobbers, $1.98, f.o.b. Chicago, and to retailers, $2.05.

Pittsburgh.—Conditions noted above as existing in the Barb Wire trade apply equally well to Plain Wire, demand for which is light and for small lots, owing to the uncertainty existing as to the future course of the market. As soon as the large trade is assured that prices will not be disturbed it is believed demand will very quickly show material betterment. To jobbers in carload lots, quotations per 100 lb. are on a basis of $1.80 for Plain, and $2.10 for Galvanized, Nos. 6 to 9, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional.

Extras on Boiler, Structural and Ship Rivets.—Many of the trade are not aware that an addition was made to the list of special extras for Boiler, Structural and Ship Rivets at a meeting of the manufacturers December 16, 1908, when it was decided that Rivets 5 in. long and over, when ordered in lots of 1000 lb. or less than 1000 lb., should be subject to an extra of 25 cents. The extras thus revised to date are as follows:

Boiler Rivets (Standard Heads)	
¾ in. diameter to 1¼ in. diameter, inclusive	Base
Structural Rivets (Standard Button Heads)	
¾ in. diameter to 1¼ in. diameter, inclusive	Base
Ship Rivets (Standard Heads)	
¾ in. diameter to 1¼ in. diameter, inclusive	Base
Standard Extras.	
	Per 100 lb.
½ in. and 9-16 in. diameters	$ .50
⅝ in. and 11-16 in. diameters	.15
Lengths shorter than 1 in.	.50
Countersunk heads in quantities of less than 1000 lb. of one diameter and length	.25
Flat Head Rivets	.25
Rivets packed in 100-lb. kegs	.10
Special Extras.	
Annealing Cold Made Rivets, ½ in. diameter and larger	$ .25
Small orders for miscellaneous sizes for less than two tons to parties not under contract	.10
Swell Neck Rivets to be charged at price of Boiler Rivets regardless of style of head	
All Cone Head Rivets (except Ship Rivets) to be charged at Boiler Rivet price	
Rivets when 5 in. long and over when ordered in lots of 1000 lb. or less than 1000 lb.	.25

Rope.—The demand does not appear to have fallen off any, nor does there seem to be any increase in requirements. Business continues in moderate proportions and orders are generally for small quantities. The small spread between the cost of Manila and Sisal Fiber has had a weakening effect upon the hard fiber Rope market, especially Manila goods. A house in the Middle West quotes Pure Fiber Manila Rope at 8 cents, base, and Pure Sisal Rope at 6 cents, base. It is well to recollect, however, that pure fiber goods are not always made of the best quality fiber. Prices on small business remain without quotable change, but on larger orders for Pure Manila Rope, 8 cents, basis, is easily obtainable. General quotations on small quantities of Rope, 7-16 in. in diameter and larger, are as follows: Pure Manila, 8¼ to 8½ cents; Pure Sisal, 6¾ to 7 cents. Mixed grades of both kinds grade down in price according to quality. Jute Rope, ¼ in. and up, No. 1, is 6¼ to 6½ cents, and No. 2, 5¾ to 6 cents.

Vitrified Sewer Pipe.—No improvement is noted in the market conditions which have characterized Vitrified Sewer Pipe during the last few months. The demand is comparatively light, buying being confined, to a large extent, to nearby requirements. Competition among manufacturers is aggressive, and while there is no quotable change in the discount of 87 per cent. in carload lots, f.o.b. factory, on first class Standard Pipe and Fittings, 3 to 12 in., it is understood that at least 88 per cent. discount is obtainable. As usual, second class Pipe and Fittings are quoted 3 per cent. cheaper.

Horseshoes and Toe Calks.—Prices on Toe Calks are ruling from 10 to 20 cents per 100 lb. lower than early in the year. A meeting of manufacturers of Horseshoes took place last week at which the situation as affected by the steel market was freely discussed, but no change in prices was decided on. It is not unlikely that a further conference will be held in the near future.

Vises.—A yielding tendency is noted in quotations on solix box Vises which are now being sold to good trade at discounts ranging below 60 and 10 per cent.

Glaziers' Points.—The quotations of a few manufacturers of Glaziers' Points reflect to some extent the recent decline in Zinc.

Soil Pipe.—The market for Cast Iron Soil Pipe maintains a comparatively firm tone, which is emphasized by the near approach of the active season. Established base discounts, which represent an advance of a point or two since the end of the year, are as follows, f.o.b. foundry: Standard, 2 to 6 in. Pipe, 68 per cent.; extra heavy, 2 to 6 in. Pipe, 74 per cent.; Fittings, 80¾ per cent. Beyond these discounts extras of 10 and 10 and 5 per cent. are generally obtainable.

Binder Twine.—Reports indicate that buying is on a moderate scale. Some manufacturers state that their sales up to the present time are above the average, while others find that the volume has not reached the usual proportions. It is understood that rather unfavorable reports regarding the condition of winter wheat have been received from the most important wheat sections, but reports a few weeks later will be considered more trustworthy. The opinion is more or less generally expressed that an unusually large number of acres will be seeded to oats this year. The demand from manufacturers for both Manila and Sisal Fiber is very light, and the difference in price between the two is being gradually lessened by the lower quotations on Manila Fiber. An unconfirmed report is to the effect that one manufacturer may substitute a low grade of Manila Fiber for Sisal in the manufacture of Binder Twine. No announcement of change in the regular schedule of prices has been announced, but a Western concern that handles Twine has quoted 6⅛ cents for White Sisal Twine (500 ft.) and 7⅛ cents for Standard Sisal Twine (500 ft.). Regular quotations are as follows:

	Cents per lb.
Sisal	7⅛
Standard	7⅛
Standard Manila (550 ft.)	8
Manila (600 ft.)	8¾
Pure Manila	10

Carloads are ¼ cent less; 5-ton lots, ⅛ cent less; fall terms; central delivery. For delivery at Missouri River and Northwestern distributing points ¼ cent is added.

Window Glass.—The continued lack of demand for Window Glass has resulted in a demoralization of the market. Manufacturers claim that at present prices they are losing money on the smaller brackets. The present price at which domestic Glass is being sold is less than Glass can be imported for, and the duty on the largest sizes of foreign is said to be greater than the cost of corresponding sizes of domestic Glass. Discounts of 90 and 40 per cent. on single and 90 and 45 per cent. on double strength Glass from October 1, 1903, list for less than carloads from manufacturers and jobbers, appear to be quite general. This, of course, has its effect upon the Eastern market, as discounts recommended by the Eastern Jobbers' Window Glass Association, oustide the Metropolitan District, are 90 and 35 per cent. on single and 90 and 40 per cent. on double strength Glass.

Linseed Oil.—Resales of carloads of Oil by holders of comparatively low priced stocks, on the basis of 53 cents per gallon for Raw, have been one of the market features the past week. One crusher of State Raw quoted the same price and some others were willing to meet the cut. While the statistical position of the market is strong, the demand is light and outside of resales specifications on contracts have covered most of the large business. Buying in small lots is light. Card prices in 5-bbl. lots are as follows: State and Western Raw, 55 cents per gallon; City Raw, 56 cents per gallon. Boiled Oil is 1 cent advance on Raw.

Spirits Turpentine.—As the result of fluctuations in price during the week, the market has gained ½ cent per gallon. Light demand at Southern points, together with the offering of tank supplies, has resulted in light buying at this point. The arrival of new crop of Turpentine

has commenced in small quantities which naturally leads the trade to anticipate lower prices. The New York market is represented by the following quotations: Oil Barrels, 40 to 40½ cents; Machine Made Barrels, 40½ to 41 cents per gallon.

AUSTRALIAN IMPORTS AND EXPORTS.

MELBOURNE, February 1, 1909.

FOR the benefit of American exporters it is well that they should be posted on facts and figures in connection with Australian imports and exports. From a return issued by the Customs Department for the year 1908, the imports are shown to have reached a total value of £49,283,757, or £2,526,276 less than the total for 1907. Eliminating gold (£973,807), the imports are less by £2,034,233, but exceed those for 1906 by £5,732,027.

The exports for 1908 totaled £64,438,970, showing a decrease on 1907 of £8,385,277. The gold export for 1908 was £14,331,122, as against £10,897,504 in 1907 and £16,875,456 in 1906.

Exports other than gold were less last year than in 1907 by £11,818,895, but the decrease in comparison with 1906 is only £2,754,459. The decrease on 1907 has been principally due to less wheat, wool and butter being available for export and to the fall in prices of wool and metals. The net customs and excise revenue for the three years is as follows: 1906, £9,251,005; 1907, £10,859,396; 1908, £11,135,323. The following table shows the value of imports and exports during the past six years:

	Imports.	Exports.
1903	£37,811,471	£48,250,112
1904	37,020,842	57,485,915
1905	38,346,731	56,841,035
1906	44,744,912	69,737,763
1907	51,809,033	72,824,247
1908	49,283,757	64,438,970

The decrease for 1908 must not be taken as in any degree representing retrogression of trade. There has for some time past been a tendency to "mark time" in the importing markets, due to accumulation of stocks, uncertainty of values and other considerations. And on present indications there can be no doubt that the current year will show a strong upward movement unless a real slump in the value of our products should occur in the markets of the world.

As an indication of internal strength there can, perhaps, be no better standard of judgment than the condition of the building trade. It is brisk throughout Australia. And not speculative building, either. We are not in the middle of a boom, yet here in this one city of Melbourne alone, during the year just ended, no fewer than 2800 suburban dwellings have been erected, at an average value per dwelling (based on the bare cost of construction) of well over £500. In addition, no fewer than 17 new factories have been built during 1908.

The current year promises to be quite as progressive, and builders' ironmongers are happy in consequence.

THE RETAIL HARDWARE MUTUAL FIRE INSURANCE COMPANY of Minnesota, M. S. Mathews, secretary, Minneapolis, has lately issued a leaflet designed to illustrate "the 1908 (mutual insurance) pie, and how it was cut." A reduced reproduction of the "pie" is given herewith. This will be recognized as an effective way of calling attention to the economy and saving secured by this form of insurance. On the reverse side of the leaflet is the December 31 statement of the company's business. The return premium for 1909 will also be 50 per cent.

THE exhibit prepared by the Carborundum Company, Niagara Falls, N. Y., for this year's State Hardware conventions was larger and more elaborate than heretofore. Over 300 shapes, sizes and grades of Sharpening Stones were shown in the display panels, while on the counters inclosing the exhibit space were shown the free display cases and cartons and other advertising matter designed to catch the public eye and increase the sale of the company's goods. The construction of the exhibit was such that it could be gathered up like a stage setting and carried from one convention city to another.

The Oklahoma Association Officials.

THE accompanying group of excellent portraits of the president, vice-president and secretary of the Oklahoma Retail Hardware and Implement Dealers' Association is a reproduction of a photograph taken for the *Daily Oklahoman* by Walton of Oklahoma City, on the occasion of the recent annual convention of the association. On the right is M. C. Hale of Tulsa, the president of the association, who, in his commanding figure and genial and cordial manner, was referred to as bearing a certain resemblance to President Taft. Next to him is D. C. Patterson of Oklahoma City, the energetic and popular secretary, while on the left is Frank Pfaff of Anadarko, who occupies the position of vice-president, and is one of the most active members of the association, contributing largely to the interest of the meetings.

J. D. WARREN MFG. COMPANY, Chicago, has issued a booklet attractively got up and illustrated, entitled "Warren System of Salesmanship." The text suggests the increased profit and efficiency to be obtained by intelligent, modern store arrangement, which is exemplified and compared with old time methods by numerous pictures. The company states that its line of store fixtures has been largely remodeled and many new ones added, so as to supply every requirement of Hardware lines.

DANIEL STERN, 355 Dearborn street, Chicago, Ill., has published "The Advertising Manual," which is described as "a treatise on the subject of advertising and an exposition of the correct methods to be applied in the preparation of newspaper advertisements from which best returns may be expected." The book contains upward of 275 pages, 8vo. size and is profusely illustrated with specimen advertisements, which are commented upon in the text.

PAPERS have been taken out incorporating the John G. Ferres Hardware Company, Johnstown, N. Y., for $50,000. The directors are John G. Ferres, Anna Ferres and A. M. Gregory. The company will take over the business for many years conducted by Mr. Ferres, which will be expanded and enlarged.

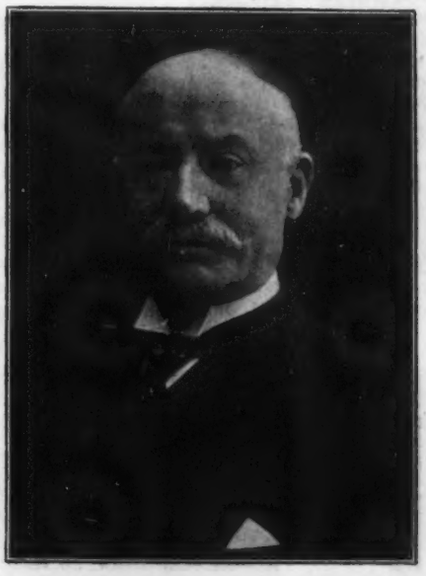
HOOLE & GESSWEIN, 101 Reade street, New York, is the title of a new firm just established to transact business with factories, mills, machine shops and similar industries using such goods as Drills, Taps, Screws, Files, Saws, Waste, Pulleys, Hangers, Shafting and other supplies required by manufacturers.

GEO. H. SEITZER, for a number of years salesman and assistant to sales manager for Stanley G. Flagg & Co., Philadelphia, Pa., has lately become connected with the Thos. Devlin Mfg. Company, also of Philadelphia, maker of Pipe Fittings and Hardware specialties.

DEATH OF CHARLES H. WIER.

CHARLES H. WIER, founder of the house of Wier & Wilson, Baltimore, died at his home in that city March 6, from an attack of acute indigestion. He was unusually robust physically, and until within two years knew little of ailments or exhaustion. His organism, however, had been overworked and symptoms of heart trouble became manifest. This condition was made light of and he was unwilling that others should know of it, even among his closest associates.

Mr. Wier was born in Baltimore, Md., October 13, 1847. He attended local and county schools until 1864, when he entered the employ of Charles E. Waters & Co., Hardware commission merchants and importers, making rapid strides in the mastery of the business. His remarkable memory and keen grasp of details soon enabled him to give the sterling values of imported goods instantly and without reference to the now indispensable price-list. He became the leading salesman of the house,



CHARLES H. WIER.

his travels, however, being confined to near-by points in Maryland, Pennsylvania and Virginia.

Owing to the death of the senior member of the firm and the incoming of new proprietors, Mr. Wier was induced to take a position with Bailey, Caldwell & Co., importers and jobbers of Cutlery, Chains, &c., soon rising to the honor of being the leading salesman and an authority, not only among men of his own age, but his seniors of many years in the quick and correct estimate of values and comparisons of prices, from the time of his apprenticeship forward. His judgment of human nature was accurate and he combined the essentials of an intelligent, alert, successful salesman.

In 1873 Bailey, Caldwell & Co. becoming financially embarrassed, Mr. Wier accepted the position of salesman and buyer for Samuel G. B. Cook, a Hardware commission merchant, whose business grew rapidly, and, notwithstanding the competition of older and wealthier houses in the line, Mr. Wier's efforts, it is said, were largely instrumental in placing the house in the front rank. In 1875 Mr. Wier was given an interest in the firm, the style of which changed to S. G. B. Cook & Co. The business grew to large proportions, but through outside investments came to financial grief in 1886, when the firm of Wier & Wilson came into existence, the character of the business changing to direct representation of Hardware manufacturers. Mr. Wier's acquaintance with the manufacturers being extensive the new firm was enabled to secure a number of leading lines for the South and Southwest, and until very recently few men on the road worked harder or more indefatigably for the interests of his patrons than did Mr. Wier.

His entire life was one of character building. Of sterling honesty himself he demanded the same in every man he met, and nothing grated so much upon his sensibilities as sham or deceit in any form. He possessed the absolute confidence of all with whom he came in contact, and his versatility, geniality, strength of mind and absolute fair dealing with fellow men for more than 40 years have left the closest ties and honored memories as a tribute, subscribed to by hundreds of sorrowing friends. Mr. Wier's home life was ideal and every moment which could be spared from business duties was spent in the company of his devoted family. He leaves a widow and three sons.

HARDWARE FREIGHTS.

Correcting Errors In Express Service.

THE traffic manager of a large Pennsylvania house calls attention to the following points which should be borne in mind in considering practically what is to be done to correct the unsatisfactory conditions which prevail in connection with the service of the express companies:

SETTLEMENT OF CLAIMS.—There should be a time limit placed by Public Service Commissions on the settlement of the claims, a matter in which the companies are not as prompt as they should be. Overcharges should be settled, say, within 30 days and loss or damage within 60 days.

OVERWEIGHT.—The companies charging for more than the weight of the package can be checkmated if shippers are particular and weigh each and every package, and mark the weights on the packages plainly, and also on the express receipts.

COLLECTING CHARGES TWICE.—All express packages that are sent out prepaid should be marked plainly "Freight Prepaid," as well as on the shipping receipt, and all consignees should refuse to pay for any package thus marked. When the merchants whose methods are thus described make any shipments, freight prepaid, they always check the amount of the expressage, noting the weight that appears in the express receipt and taking the rate of freight from the company's own tariff.

The point is made that many shippers do not realize the fact that express companies' business is handled differently from freight business, as their manifests are made directly from the packages when they are delivered to the respective offices, and no manifests are made from the shipping receipt; therefore the plainer the package is marked with the weights, and either "Freight Prepaid" or "Freight Collect," the less opportunity for overcharge.

Requests for Catalogues, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM GEO. H. CLEVELAND, who will open a store in Camden, Maine, handling Shelf and Heavy Hardware, Housefurnishings, Window Glass, Implements, Paints, Sporting Goods, &c.

FROM PALACE HARDWARE COMPANY, which has opened a new store in Great Bend, Kan., carrying Shelf and Heavy Hardware, Stoves, Housefurnishings, Paints, Sporting Goods and Sewing Machines.

FROM MASON BROS., Volant, Pa., who have completed their new building and are in the market for Hardware, Building Material, Roofings, Paints, Glass, Housefurnishings and Saddlery.

FROM SAMUEL BERMAN, 4 Portland street, Boston, Mass., who wishes to receive catalogues of Tools, Builders' Hardware, &c., and is particularly interested in job lots, seconds, discarded patterns, &c.

Arnold & Sons have engaged in the Implement business in Friend, Neb.

NEW ENGLAND RETAIL HARDWARE ASSOCIATION.

The New England Hardware Dealers' Association held its annual meeting at Springfield, Mass., Thursday and Friday, March 11 and 12. In recent years the association has confined its meetings to Boston, and the departure from the custom was watched with interest and with the result that a rotation in place of conventions will undoubtedly be established. The social features of the two days cut into the meeting, but important business was transacted, including the vote to establish permanent headquarters in Boston, with an assistant secretary in charge. One feature of the entertainment that was highly valuable was the inspection of the plants of the J. Stevens Arms & Tool Company and the Stevens-Duryea Company at Chicopee Falls. Equally beneficial to those who could avail themselves of the opportunity was a trip to Greenfield as the guests of the Wells Bros. Company, Saturday morning.

The convention opened Thursday afternoon at the Cooley House, with President S. H. Thompson in the chair, and a large number of members present. Mayor Sanderson of Springfield welcomed the visitors in a graceful speech, and presented them with the key to the city, which was an event in itself. Two stalwart policemen were required to bear it into the convention hall; as it rested against the wall back of the president's table it towered high about the head of the tallest men in the room. President Thompson accepted the key from the Mayor, and there was much laughter. Later in the session the president appointed a delegation of stalwarts to carry it to the exhibition hall.

The convention thus happily opened was eminently successful and greatly enjoyed by all in attendance. The hearty welcome extended and the hospitality of the merchants and manufacturers gave the visitors a very pleasant impression of Springfield and of its importance as a manufacturing and distributing center.

F. E. PEIRSON.

S. H. THOMPSON.

D. F. BARBER.

Question Box.

F. Alexander Chandler, Boston, member of the Executive Committee of the National Retail Hardware Association, presided over the Question Box discussion. In answer to the question, "*How to reward those clerks who keep well*," a member stated that all Hardwaremen know what it means to have clerks absent from the store because of indisposition resulting from various causes, some of them preventable. A Boston house has adopted a system under which each employee is given one week a year, apart from vacation, for these various causes of absence. Pay is deducted for all other time taken. The clerk who is punctual and always ready for business gets his week just the same as a reward of merit, not necessarily with his vacation, for that may be impossible, but sometime during the year.

In response to the question, "*Does it pay the Hardwareman to devote time to State or civic duties*," one of the merchants who is a prominent member of the Massachusetts Legislature, said:

I do not know if the Hardwareman can afford to take this time, but I am convinced that it is his duty to do so. If he lets others run civic and State affairs he is not doing his share towards controlling the laws affecting his business. Not a man here would let a stranger enter his store, run the cash register and conduct his business, but you let men who know nothing about it to carry on the great business of the town, city or nation.

It would be cheaper to let the stranger come into your store and run it, where you could watch him, than to let him transact the greater business of State. I believe there is a great chance to-day for the business man in political life. Apart from the public duty there is another side of the question. You have heard of "honest graft." You get business from your political associations. Men come into your store, first on political errands, then for trade. But the great element is the duty which is performed.

Secretary's Report.

Charles L. Underhill, Somerville, Mass., the efficient secretary, in his annual report, among other matters, touched especially on the importance of getting new members and thus increasing the influence and value of the association. We give the following extracts from the report:

We learn each year by experience how to improve the conditions in the Hardware trade, and, although the progress is apparently slow, still we are gaining and accomplishing some of those things for which we are organized. Never was there a time when organizations of this kind were so numerous as now, and never before did Hardware merchants join hands with such friendly social greetings.

Success in life should not be measured from a financial standpoint alone, but it should help in the advancement of our fellowmen socially and morally as well. Your officers have had this in mind during the past year, and by their efforts have endeavored to make you better acquainted one with the other.

Importance of Increased Membership.

I wish to renew the recommendation in my report of last year as to the great advantages that are to be derived from an increased membership. We have added to our roll this year almost 50 new members, but we are still far short of the number that we should have. If we can increase our membership to 500, which seems to me very reasonable, we could have a corresponding secretary who would devote most of his time to the office, keep in close touch with all of the members, send them a monthly report of the conditions surrounding the trade, and such other information as would serve to keep alive the individual interest and increase the efficiency of the organization as a whole.

I think that many of the members have a wrong idea of the purposes of the association, as they only hear from the secretary about once or twice a year, and then with regard to this annual convention or of the summer outing. It gives the impression of sociability rather than business, and those who are unable to attend the convention get a wrong idea that they are not receiving their money's worth. If circumstances should prevent your attendance at the convention, the moral and financial support that your membership means keeps the association that much more vigorous and effective.

Trade Organization.

The trade conditions that confront the retail Hardware dealers demand that they band themselves together for mutual protection and progress, and as an association to use every legitimate means for advancing our interests. This and like organizations in other States have already accomplished much that has been and will continue to be a benefit to all.

When I receive through the mail the resignation of a member with the explanation that he derives no benefit from his membership, I say things which would not sound well in print nor look well in my report. If that individual could sink his selfishness and become an officer or even an active member in the association, he would find that we are spending many hours planning for just such chaps as he is, without hope or expectation of reward, and usually without even a thank you.

I do not wish to be considered pessimistic; on the contrary, I think we should all be encouraged by the results obtained during the past year, and we should resolve to do everything in our power to continue and advance this work.

Mutual Insurance Has Made Good.

I wish to say a special word with regard to the Hardware insurance companies. These are no longer in the experimental stage, but have made good, exceeding the most ardent expectations of their organizers. They are as strong as the old line companies, and you will find it to your advantage to take insurance with one or more or these State mutuals. You can save from 25 to 50 per cent. on insurance on a total amount of $27,000, divided in policies of from $3000 to $5000 with each company.

By bringing this fact to the attention of nonmembers you can secure applications, as they must be members of our organization in order to enjoy this privilege, and, although you may not be an officer of the association, this is one feature of the work in which you can participate.

Permanent Association Headquarters.

Mr. Chandler brought up an important topic of discussion by advocating an associate membership, to include manufacturers, jobbers and their traveling representatives, and the establishment of permanent headquarters at Boston. Mr. Chandler submitted arguments in behalf of these two propositions, and subsequently quite an interesting and animated discussion took place. It was finally decided not to have an associate membership, but the proposition of a permanent headquarters was looked upon with favor, and it was decided to open an office in Boston with an assistant secretary in charge, the details being left to the officials of the association.

New Officers.

The following officers were elected for the ensuing year:

PRESIDENT, Frank E. Peirson, Pittsfield, Mass.
FIRST VICE-PRESIDENT, D. Fletcher Barber, Boston.
SECOND VICE-PRESIDENT, H. L. Russell, Holyoke, Mass.
SECRETARY, Charles L. Underhill, Somerville, Mass.
TREASURER, H. M. Sanders, Boston.

DIRECTORS: Frank E. Stacy, Springfield; J. Herbert Seaver, Dover, N. H.; F. Alexander Chandler, Boston; J. Strockbine, Watertown, Conn.; Byron C. Peirce, Taunton, Mass.; S. E. Pope, Jeffersonville, Vt.; H. P. King, Portland, Maine; J. F. Willets, Roxbury, Mass.; W. H. Underwood, Manchester, N. H.; W. H. Sawyer, Providence, R. I.; Elwood Adams, Worcester, Mass.; H. L. Russell, Holyoke, Mass.

New Members.

New members of the association were elected as follows:

Hardwick Hardware Co., Hardwick, Vt.
Fred. Blanchard, Montpelier, Vt.
C. L. Cook, Millers Falls, Mass.
Hitchcock Hardware Co., Watertown, Conn.
Duncan & Goodell Co., Worcester, Mass.
Herbert A. Graves, Springfield.
William K. Toole, Pawtucket, R. I.
Francis J. Duffy, Pawtucket, R. I.
W. M. Leary, Farmington, Me.
F. W. Barrie, Pittsfield, Mass.
J. A. Barnum, Somerville, Mass.

H M. SANDERS.

CHAS. L. UNDERHILL.

GEO. J. BASSETT.

Central Square Hardware Co., Cambridge, Mass.
Fuller Hardware Co., Fitchburg, Mass.
Bacon & Donavon, Springfield, Mass.
C. H. Parmelee, Wilmington, Vt.
Henry W. Thompson, Millbury, Mass.
F. E. Stacy, Springfield, Mass.
J. Douglas Law, Springfield.
George A. Graves, Springfield.
J. E. Barnum, Boston, Mass.
Charles J. Gray, Gloucester, Mass.
Berkshire Hardware Co., Pittsfield, Mass.
D. Fairbanks, West Brookfield, Mass.
Field & Lawrence, Bellows Falls, Vt.
J. Herbert Seavey, Dover, N.H.
D. R. Harvey, Boston, Mass.
N. S. Love, C. W. Averill, Barre, Vt.

Trip to the Stevens Plant.

By courtesy of the J. Stevens Arms & Tool Company the members of the association, with their ladies and many other guests, enjoyed a trip to the company's plant at Chicopee Falls, Friday morning. The party, numbering over 200, was conveyed in special cars chartered by the hosts, who entertained their guests in a most lavish manner. On arrival at the Falls the party was divided into squads, each accompanied by a representative of the company and a member of the association Entertainment Committee, and conducted through the Stevens-Duryea automobile factory. This completed, automobiles were waiting to carry them to the hill plant of the J. Stevens Arms & Tool Company, where an elaborate buffet lunch was served, while music was furnished by a splendid band made up of employees of the company.

The menu was most ingeniously gotten up in the form of a target, to which a miniature Gun was attached with red, white and blue ribbon. The different courses were cleverly described in terms of the Gun and Ammunition business, while the ice cream was served in a shape representing a bottle of Gun Oil bearing the actual label. Cigars having been distributed to the gentlemen and flowers to the ladies, the party was shown through the Gun plant before returning to Springfield. It is safe to say that the occasion was a memorable one for all the guests, and hearty appreciation was expressed to I. H. Page, president of the company; T. C. Page and C. P. Fay, vice-presidents, and C. A. Stein, advertising

manager, who acted as hosts, for their delightful hospitality.

The Banquet.

The banquet on Friday evening at Cooley's Hotel was a most delightful occasion. The company numbered about 300 persons, including many ladies. Samuel H. Thompson, president of the association, acted efficiently as toastmaster, and introduced the following speakers: Mayor Sanderson of Springfield, Frank E. Stacy, president of the Western Massachusetts Hardware Association; Mayor Avery of Holyoke, Hon. Frank Kemp of the State Legislature, and the Rev. John S. Lyon, D.D., of Holyoke, whose addresses were listened to with much interest and appreciation. The *menu*, inclosed as it was in a handsome brass butt furnished by the Stanley Works, New Britain, Conn., was striking and unique. Another souvenir of the banquet was a leather pocket match box, given out by the Coburn Trolley Track Mfg. Company, Holyoke. For the marked success of the evening much credit is due to F. D. Foot, chairman of the committee, and his associates.

CONVENTION NOTES.

Saturday morning a goodly group of the visiting members visited Greenfield, Mass., where they were the guests of the Wells Bros. Company. They were given the opportunity to inspect a model establishment, following through the processes of manufacturing Taps and Dies on a large scale. The merchants doubtless carried away with them lessons learned in system as well as a new knowledge of how goods that they handle are manufactured, and the occasion was much appreciated by the members.

The greatest appreciation was felt and was universally expressed for the unselfish labors of the committee, upon whom devolved the work of preparation of the convention. They met regularly for many weeks prior to the convention, and left nothing undone which could add to the success of the occasion, the smoothness of all arrangements and the pleasure and comfort of the guests. The wheel horses were, of course, the local merchants and a few other members of the Western Massachusetts Association, among whom may be mentioned F. E. Stacy, F. D. Foot and E. L. Graves, Springfield; H. L. Russell and A. J. Osborne, Holyoke, and F. E. Peirson, Pittsfield. The complete Reception Committee, most of whom made themselves personally responsible for the comfort of every individual present, was as follows: F. E. Peirson, S. H. Thompson, H. L. Russell, J. R. Gladwin, Elwood Adams, O. C. Alderman, B. C. Pierce, C. C. Lewis, A. H. Abbe, A. J. Osborne, F. E. Stacy, O. B. Parks, W. H. Sawyer, C. A. Foster, F. F. Shepard, G. E. Doane, H. A. Lee, W. A. Peirson.

The official programme of the convention was a handsome booklet of 66 pages, containing not only details of the arrangements, but a number of typical views of the city of Springfield and other details which were of interest to the visitors.

The report of Treasurer Henry M. Sanders, Boston, showed that the association had the comfortable balance of $1432 on its books.

Thursday afternoon the ladies, of whom there were an unusually large number present, attended the opening of the convention and watched the presentation of the key to the city. Later afternoon tea was served them in the Cooley House parlors. Mrs. Samuel H. Thompson, wife of the president, made an able and interesting address to them, which was highly appreciated.

The theater party Thursday evening was a function of much pleasure, a good show of the lively order being universally enjoyed. The ladies enjoyed another theater party Friday afternoon while the business session was in progress.

HARDWARE EXHIBITION.

The exhibition of manufactured goods in Hardware and kindred lines held in Graves Hall, was large and

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very representative. The large main hall was filled to overflowing, the exhibits extending into an annex and occupying all of a smaller hall on a lower floor. The decorations were tasteful. The exhibitors and their representatives were as follows:

AMERICA-LA FRANCE FIRE ENGINE COMPANY, Elmira, N. Y.: Nonfreezing Fire Extinguishers, Hose. Represented by F. M. Watters, R. D. Hazard.

AMERICAN SAW MILL MACHINERY COMPANY, New York City: Circular Saws and Mill Machinery. Represented by H. H. Hirschfeld.

AMERICAN STEEL & WIRE COMPANY, New York City: Fencing. Represented by L. A. Dietrich, C. L. Sherman, J. G. Fletcher.

BAEDER, ADAMSON & CO., Philadelphia: Emery Cloth, Flint and Garnet Papers. Represented by E. F. Russ, J. T. Floyd.

BARNEY & BERRY, Springfield, Mass.: Skates

BATEMAN MFG. COMPANY, Grenloch, N. J.: Iron Age Farm and Garden Implements.

BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.: Wrenches, Drive Punches. Represented by A. C. Cordner.

J. A. & W. BIRD & CO., Boston: Rex Flintkote Roofing, Zolium. Represented by J. S. M. Holley.

MILTON BRADLEY COMPANY, Springfield, Mass.: Card and Paper Cutters, Drawing Instruments. Represented by C. A. Hastings.

BRIDGEPORT WOOD FINISHING COMPANY, New Milford, Conn.: Paints and Wood Finishing Products. Represented by J. Fred Simpson.

BROWN & SHARPE MFG. COMPANY, Providence, R. I.: Mechanics' Tools. Represented by G. M. Pease.

BROWN STAMPING COMPANY, Toledo, Ohio: Oil Cans and Tanks, Tin and Galvanized Ware. Represented by R. F. Reynolds.

BULLOCK MFG. ASSOCIATES, Springfield, Mass.: Mechanics' Tools.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Abrasive Wheels and products. Represented by John MacArthur, J. E. Rayner, H. H. Miller.

PHILIP CAREY MFG. COMPANY, Lockland, Cincinnati, Ohio: Roofing. Represented by W. A. Ladd.

CHAPMAN VALVE MFG. COMPANY, Indian Orchard, Mass.: Valves, including new type for Brooklyn high pressure water service.

GEORGE P. CLARK COMPANY, Windsor Locks, Conn.: Trucks, Castors. Represented by W. M. Lyman.

COBURN TROLLEY TRACK MFG. COMPANY, Holyoke, Mass.: Sliding Door Fixtures, Automatic Fire Doors. Represented by F. D. Thorpe, Harry E. Ballard.

R. E. DIETZ COMPANY, New York: Lanterns, &c. Represented by N. R. Cerf.

DU PONT POWDER COMPANY, Wilmington, Del.: Explosives. Represented by H. B. Ternby, J. H. Peckham.

EAGLE LOCK COMPANY, Terryville, Conn.: Locks. Represented by S. S. Fischer, A. E Gard.

GOODELL MFG. COMPANY, Greenfield, Mass.: Steel Miter Box.

C. T. HAM MFG. COMPANY, Rochester, N. Y.: Tubular Lamps and Lanterns. Represented by N. R. Cerf.

HARRISON BROS. & CO., Philadelphia: Paints. Represented by Hector M. Gordon, W. G. McIntyre, S. W. Gifford.

HART & COOLEY COMPANY, New Britain, Conn.: Steel Registers. Represented by W. E Stevens, G. B. A. Baker.

HENDEE MFG. COMPANY, Springfield, Mass.: Indian Motor Cycle. Represented by W. F. Hapgood.

W. A. IVES MFG. COMPANY, Wallingford, Conn.: Mephisto Auger and Expansion Bits. Represented by Adolph Perlroth.

LISK MFG. COMPANY, Canandaigua, N. Y.: Enameled, Galvanized Anti-Rust Tinware, Nickel Plated Copper Ware. Represented by C. F. Watson.

MASSABOIT COMPANY, Chester, Mass.: Abrasive Wheels. Represented by E. P. Marsh.

MASSACHUSETTS SAW WORKS, Chicopee Falls, Mass.: Hack Saw Blades and Frames, Saw Specialties, Nail Sets, Center and Prick Punches. Represented by H. F. Strout.

MOORE DROP FORGING COMPANY, Springfield, Mass.: Wrenches, Blacksmith Tongs. Represented by A. H. Chapin, F. D. Fuller.

MORSE TWIST DRILL & MACHINE COMPANY, New Bedford, Mass.: Drills, Milling Cutters.

NOERA MFG. COMPANY, Waterbury, Conn.: Oil Cans, Auto, Bicycle and Motor Cycle Pumps. Represented by G. W. Seeton.

OHIO VARNISH COMPANY, Cleveland, Ohio: Chi-namel graining, staining and varnishing materials. Represented by Fred Crooks.

CHARLES PARKER COMPANY, Meriden, Conn.: Vises, Coffee Mills, Wood Screws. Represented by A. W. Proudman.

PERFECTED SELF-LIGHTING MANTLE COMPANY, Springfield, Mass.: Mantles for Vapor Lamps. Represented by J. R. Gilfillan and P. C. Adams.

PERKINS MFG. COMPANY, Westfield, Mass.: Arabesque Ware. Represented by Charles Hall.

PHILADELPHIA LAWN MOWER COMPANY, Philadelphia: Represented by E. E. Hawks.

PIKE MFG. COMPANY, Pike, N. H.: Abrasive Stones, Tool Grinders. Represented by John A. Winters, Herbert R. Conner.

POTATO IMPLEMENT COMPANY, Traverse City, Mich.: Represented by E. H. Sheldon, R. M. Emerson.

E. F. REECE COMPANY, Greenfield, Mass.: Screw Plates, Taps and Dies. Represented by Geo. H. Kilkins.

S. & I. COMPANY, Springfield, Mass.: Carpenters' and Mechanics' Tools. Represented by F. Raymond Ives.

SHARPLES SEPARATOR COMPANY, West Chester, Pa.: Cream Separators. Represented by W. H. Cooney and L. M. Somes.

SHELBY SPRING HINGE COMPANY, Shelby, Ohio: Wrought Builders' Hardware. Represented by J. N. Limeburner.

STANDARD PAINT COMPANY, Boston: Paints. Represented by Charles Earnshaw.

STANDARD TOOL COMPANY, Cleveland, Ohio: Twist Drills, Taps, Reamers, Milling Cutters. Represented by Charles F. Loughead and E. Van Camp.

STANLEY WORKS, New Britain, Conn.: Builders' Hardware. Represented by W. E. Stevens, G. B. A. Baker.

L. S. STARRETT COMPANY, Athol, Mass.: Mechanics' Tools. Represented by H. E. Masters.

H. D. SMITH COMPANY, Plantsville, Conn.: Wrenches, Chisels, Screwdrivers, Double Delight Ice Cream Freezer. Represented by C. W. Camp.

THORNE HOLD-FAST METAL BAR COMPANY, Troy, N. Y.: Eclipse Threshold Bar. Represented by B. F. Burdick.

WADSWORTH-HOWLAND COMPANY, Boston: Paints. Represented by F. D. Lantz.

WALLINGFORD MFG. COMPANY, Wallingford, Vt.: Steel Goods, including an interesting exposition of the processes of manufacture as well as of the finished goods. C. A. Hoagland was in charge and was assisted by W. R. Chamberlain.

F. E. WELLS & SON COMPANY, Greenfield, Mass.: Screw Plates, Taps and Dies. Represented by George H. Wilkins.

A. WILHELM COMPANY, Reading, Pa.: Paints. Represented by E. T. Gould, W. H. Dennis.

YALE & TOWNE MFG. COMPANY, Stamford, Conn.: Builders' Hardware, Door Checks, Padlocks, &c., Represented by L. C. Walker, C. B. Alford.

PRESIDENT'S ADDRESS.

The presidential address of Samuel H. Thompson, Lowell, was an able and thoughtful document. It was in part as follows:

The past year has been full of difficulties and perplexities, and we are just emerging from under the clouds of great doubt and financial depression and the smile of prosperity is illuminating the face of trade again. We shall, however, be no farther along in life's great school if from these experiences we have not learned great lessons, and one of the most important of these is that of readjustment, for the period through which we have just passed has made new conditions into which we must enter in the future.

A Quickened Conscience.

We are facing a most interesting epoch in our nation's history. Ideals are higher, the national conscience through the examples set and enforced in many instances by our former chief executive and many others in high authority has been greatly quickened, and men are finding that honesty is best even if compelled by policy to so act, and there will be fewer manufacturers in the years to come who will put up 17 yd. packages of Picture Wire and call it 25 yd., and short count and short weight and short measure goods will receive the condemnation they deserve.

Parcel Post.

Much has been written and said about the portending evils of the parcel post which is being pressed for passage by those high in authority and bitterly opposed by many merchants in our country. Many splendid arguments have been made and much intemperate talk has been indulged in throughout it all, while the natural causes which led to the projection of such a bill into Congress have been entirely overlooked or ignored.

All sorts of reasons have been given as to the conception of the bill, while so far as I am able to learn the great population of our country has never been consulted as to why it should not have a more convenient and cheaper form of delivery. It will be well, therefore, for us to think back as to the natural causes that led to efforts to pass a parcel post bill. We have only to look to the abuses heaped upon merchants and the public alike by those great common carriers, the express companies, to find a ready answer, and had one-tenth the efforts of our associations and press been expended in attempting to bring them to justice parcel post would not be heard of. Here is a tangible illustration of the law of supply and demand being abused by great common carriers. You have not to go back very far to remember how much inferior the service to-day is on all the express lines than formerly, while rates have been continually increased as an added source of irritation. The large express companies' contract with the railroads is such as to practically throttle any attempt at defense by competitors, and yet beyond a faint attempt, which was abortive in effect, on the part of the Boston merchants no real attempt has been made to demand from our States and Government better service and just rates from these great express companies. They seem to be beyond the reach of the general public, and it is not to be wondered at that the public has at last looked to the Government for relief.

Unsatisfactory Express Service.

It has been often asserted that the parcel post bill is a child of the catalogue houses. I don't believe they are the

parents, but they, seeing it was a "likely child," doubtless would like to adopt it.

But in the event of its passage we will all have an equal privilege in using it, and while some may suffer at first, the great law of compensation will at last prevail, for so great a service as this would render could not alone be utilized for fattening two or three catalogue houses. Calm judgment would show that such structure would soon fall from unstable equilibrium.

Will Confer Equal Privileges.

Let us remember that trade, like water, flows in natural channels and along lines of least resistance, and if it becomes dammed in places woe be to obstruction in its path when it breaks loose, for it will then surely cut for itself new channels, deeper sometimes than the old. No catalogue house can live longer than the support it receives from the public warrants, and if it is honest in its treatment of the public it will continue to live till changes occur to displace it.

Public Support.

If these houses are dishonest, please be honest enough with yourself to believe that the maxim of Abraham Lincoln still prevails: "You can fool all the people some of the time and some of the people all of the time, but you can't fool all the people all of the time." You must give the people as a whole credit for being intelligent.

I would therefore urge that with your efforts against parcel post legislation you put an equal amount of effort in protesting against the treatment we are receiving both in rates and service from the great express companies. We have only to look at the enormous dividends paid by three of these companies the past few years to know we are justified in our complaints.

Association a Pioneer.

Let us not forget that we were one of the parent organizations and we should keep our name and ambitions of the highest. Our children are scattered all over our land and have gone into other countries. We can with pride say, "Behold our children. Though they be mightier than we, they are our children and the good they do is the good we have done."

One of the plans we should make at this convention is for a larger organization that will take in at least 500 members, and in this way strengthen our influence along all lines. There are many reasons for banding together.

The good derived from association membership is greater than you can measure by immediate results, for you meet men of kindred minds, and there is pleasure in this and in the exchange of ideas there is added pleasure, for life is not made up of what you can get out of it only, but what you can give to it of your own self.

This is one of the avenues in which we may enter to do effective and helpful work by the spirit of co-operation. Let us each do his part by a contribution of himself.

HOW TO MAKE ADVERTISING PAY.

Geo. J. Bassett of Jno. E. Bassett & Co., New Haven, Conn., read a valuable paper on advertising and how to make it pay. Mr. Bassett, in view of his success in advertising his own business, is well qualified to discuss the subject. His paper was substantially as follows:

Does advertising pay? is a question that has been asked ever since printer's ink was invented, and probably long before that, in some of its many forms. Advertising has many guises and disguises, but to most of us it suggests first of all printer's ink, and it is that form of advertising that I'm going to talk about.

Now to answer the question, Does advertising pay? I should say from my own viewpoint, No; positively no! I don't mean by that that no printed advertising pays. It would be as foolish to say that as to say that all advertising pays. But what I do mean is that of all the money spent in advertising in this country

More Than One-Half Is Thrown Away.

I believe that just as thoroughly as I believe that some advertising does pay; but, of course, I cannot prove it any more than the next advertising solicitor who calls on you can prove that his own pet publicity project will double your business in a year. Take any newspaper or magazine to-day and it's just chock full of ads. of every blessed thing that man in his inventive wisdom ever produced to draw shekels out of a gullible public.

The solicitor will tell you of the millions made in advertising; how Smith made the public cough up good money for his cough drops; how Jones made the public pay the profit while he "paid the freight;" and Robinson—well, he won't tell you much about Robinson, for the Robinsons are the fellows who pay the advertising bills of the Smiths and the Joneses. You'll find them advertising in every paper you look at, and the funny thing about it is that they think advertising—their kind of ad.—pays. They'll tell you they believe in "keeping their names before the public," as if the public cared where they keep their names.

They Keep on Saying

in the papers, "I keep Hardware," "I keep Hardware," over and over and over again. What would you think of a man who confined his conversation to one or two such phrases? You'd think he was a bit narrow in his intellect, wouldn't you?

But there are a lot of good, live, hustling merchants whose advertising is built on just such lines, and many of them are successful. But they are successful not on account of their advertising, but in spite of it. Many of those men would make a lot more money if they dropped their advertising entirely. They, at least, would not be paying for the other fellow's space.

The Secret of Advertising.

But I'm wandering from my subject. I am supposed to tell you how to make advertising pay, and not how to waste money just for the pleasure of seeing your name in print. To my mind the secret of the whole matter is to tell your story to the public in such a way that the public will take notice.

But, first of all, you've got to have a story—you've got to have something to sell. All Hardwaremen have plenty of story material lying around loose all ready to be properly edited and placed before the public. Of course, you cannot dope out Hardware so it will sound as interesting to the average woman as dry goods or to the average man as wet goods, but still you can touch it up so it will come in ahead of the "also rans."

Making Use of Your Personality.

If you've been in the Hardware business very long you must have acquired some kind of a personality—either you're a grouchy pessimist, or a fool optimist, or some shade of color in between, or perhaps just a bit off color. Now, in writing your advertisements just give them a touch of the same personality you inflict on a customer when you catch one. A house-to-house talk with a customer makes a mighty good advertisement, and the intelligent reader can usually supply the verbal seasoning which you omitted.

The trouble is you won't do it. I've known merchants who could talk a deaf and dumb man into buying a Phonograph, but who couldn't any more write a decent ad. than they could build a flying machine. They would manage, after mixing perspiration with profanity for half an hour, to produce something like this:

> N. B.—TAKE NOTICE
> **JOHN SMITH & CO.**
> Hardware, Nails and Builders' Supplies
> LOWEST PRICES
> COME ONE COME ALL

Then he'll publish that and confide to you afterward that advertising doesn't pay; he knows, he tried it. and yet

It's Easy Enough to Write Interesting Advertisements,

provided you know your business and believe in it. If you're a good salesman and wish to sell a customer a Saw, you'll tell him things about that Saw that will interest him; you believe it's a good Saw and you'll make him believe it, too. Now, if you put that same spellbinding act down in black and white, polish it off a little—not too much—cut out the superfluous words and give it a catchy heading you'll have an ad. that will go, because it has your personality back of it.

And if you keep at it for a while you'll acquire a certain form, and people will talk about your ads. and you will become prosperous and happy.

Of course, I'm speaking now of advertisements in newspapers in cities of moderate size, I am not advocating the buying of high-priced space in columns of metropolitan dailies, unless the advertiser is willing to give a lot of intelligent thought to the use he will make of such space. There must be some sense of proportion.

I knew a merchant in a small town whose ads. were always read with interest because they were original. Some one stole his Horse Blanket one day, and for months afterward in his advertisements he would berate the cuss who stole that Blanket. It may not have been good advertising, but it certainly attracted some attention.

Frequent Changes.

Newspaper ads. should be changed often—in dailies at least two or three times a week. People tire of reading an ad. more than once. Have an attractive heading, but have one that belongs to the rest of the ad.; and, above all, don't use a lot of catch phrases which are older than the Springfield *Republican*, and which kill an ad. from the start. Don't try to advertise all the goods in your store on the same day. That sort of advertising is a bit ancient.

Position and Typography.

The position of your ad. in the paper should be selected with care, and it should always appear in the same space. I

also believe it pays to give special attention to the typesetting and arrangement of an ad., and in the occasional use of small and appropriate cuts.

In my own case I have thought it best to have all newspaper ads. set up by a job printer, in order that the typography should be different from that of the surounding ads.

The Use of Cuts.

In this kind of chatty advertising I don't believe in using many cuts. The little thumb nail sketches which you can stick up in one corner are good provided they are apropos to the line of talk you're handing out. But it's hard to get good ready made cuts. They are usually misfits. Most of them are too big, and the papers charge just the same per inch for bad cuts as they do for good stuff. So unless you have good and appropriate cuts to put in, don't use any.

Above all, don't use cuts out of proportion to each other. I've seen the cut of a Putty Knife which was larger than the Lawn Mower next to it.

Display Advertising.

A big display advertisement is a kind of publicity cocktail. It stimulates business, but should not be indulged in too often, as it's an expensive habit. It should be made up mostly of ginger and should not be "dry." It's especially good for special sales and for seasonable goods.

Street Car Advertising and Billboard Posters

are good, but expensive methods, of making the public familiar with your name, but they do not give you the same opportunity of telling your daily fairy tale as does the daily newspapers. I think they are especially good for firms who are not well known, and who wish to keep their names in the public eye.

Circulars and Booklets.

The carefully worded circular or booklet mailed to the proper people will often give excellent returns on the investment. If it's a circular letter it should be concise and not too long, if it's a booklet it should be attractive and well printed. It doesn't cost any more to mail a good booklet than a poor one.

Don't send a circular under a 1-cent stamp. If it's good enough to send, it's worth 2 cents at least. When a man opens an envelope, bearing a light green picture of Ben Franklin, he instinctively draws up the waste basket. It's hard on Ben, but it's true. There's a psychological reason for it which I won't stop to explain.

Newspaper men and others will tell you that circular advertising doesn't pay. Of course, they will; it doesn't pay them. We do more or less of this kind of advertising, and one day a customer said to me: "Why don't you advertise in the newspapers? Now and then I get some little booklet from you, but I've never seen your ad. in the papers." I told him that we advertised in all the newspapers every day, and that the fact he had noticed the booklet and not the newspaper ad. spoke well for the former.

To sum up the whole advertising proposition, I would say this: Study your local conditions, select your mediums with care, change your ads. frequently, and don't for a moment think that advertising will pay unless you give it the same intelligent and constant attention that you give to the other details of your business.

PRICING OF GOODS.

D. Fletcher Barber, Chandler & Barber, Boston, read an interesting paper entitled "Pricing of Goods," as follows:

The question of proper pricing of goods is so necessary that it needs no apology or argument. It is done, however, in many instances in a slipshod manner that does not reflect credit upon merchants, and is often not as progressive as the general condition of the establishment would seem to warrant.

We have seen in some otherwise splendid stores clerks having to take down slovenly looking books or lists which strongly reminded one of a poorly kept scrap book, or list of little value; and, furthermore, took a good deal of valuable time of customer and clerk trying to find the proper price.

What the Customer Thinks.

I say valuable time, for while the time of any merchant or clerk is valuable, when the time of the customer is taken up or rather consumed, this is valuable indeed, as you can well understand that when the customer is not interested in looking at goods, but has to wait while you or the clerk is trying to find something apparently unfamiliar, his thoughts are probably something like this, "That man doesn't know the price, and doesn't know where to find it, and I am going to get stuck."

Anything that will lead a customer to such a conclusion is not conductive to increased business, which is the goal toward which we are all striving.

Office Price Book.

I maintain that even if the store is so small that only one clerk is needed to attend to the business, the pricing should be done at the office—that is, the proprietor should have the new or corrected prices in his office price book, and the store price list or lists should be corrected from that. Too generally the price is made on the box, or on the article, and no attention is paid to correcting the office price book.

No one, even the storekeeper with one clerk, can afford to spend time running about the store to gather up prices scattered about on shelves or goods, as with such a haphazard way of doing things there can be no regularity, and customers soon find out this fact, and will prefer to do their trading where there is more system and attention paid to this important matter. Where they find there is close attention paid to this work and the lists present a clean and attractive appearance it shows on its face that the matter is looked after closely, and therefore the prices must be right.

We think therefore, first, we should aim for the best result with the least amount of work.

Second, we wish to find the most expeditious and exact way of pricing and finding the price.

Third, we wish to find some way of duplicating these price lists with the least amount of time and energy.

Chandler & Barber's Method.

I have here some samples of our old system of pricing, which consisted of the price cards formerly issued by Mr. Root of Detroit, but which we have bought for a number of years from *The Iron Age* of New York City. These easily became defaced, and in the case of such articles as Files, Drills, &c., which are covered with grease, the lists in a short time become entirely illegible.

To correct this, we used to punch holes through the lists, cover them with celluloid, and fasten the two sides with ordinary brass fasteners, such as are used for paper. This involved the making of the office price list and the copying on to these cards. This, of course, was a good deal of work, and often mistakes were made which could not be found out except by careful supervision, or after a period of time during which we have lost more or less according to the extent of the error.

Some time ago we gave this matter a good deal of attention, and with the assistance of some of our friends, the jobbers and others, we were able to find a loose leaf price list which seemed of suitable size, and after a rough draft of the pages had been made, these were given to the stenographer, who made duplicates. As many copies can be made as are necessary, and one page is inserted in the store list, which is hung on brackets like the sample which we have here, and which is protected on both sides by celluloid face.

Of course, only one side of the sheet is used, but as we have a number of duplicates this is not an item to be considered. We can therefore make as many price lists for salesmen as may be needed, and we are sure that they are all alike, so that if corrections have to be made, they are made so that all the lists are exactly alike.

Even if the store is too small to have a typewriter, or the duplicating machines, this plan may be adopted by using the carbon sheet and a hard pencil or stylus; but, of course, it would be necessary to hold the sheets firmly. This is done by pins or screws inserted in the perforations wherever they occur. When we have done this we have taken two boards having a brass screw inserted from the back, and, after the sheets were in, putting on the nuts which hold them firmly in place. It is necessary to have two boards so as to use both sides of the sheet.

RUNNING A STORE BY DEPARTMENTS.

An interesting and suggestive paper on running a Hardware business by departments was read by H. L. Russell, J. Russell & Co., Holyoke, Mass. The paper was based on the experience of the house in this direction, and was as follows:

This subject was doubtless assigned to your humble servant for the reason that our concern has had some experience the past two or three years in that line. You will ask the usual question, "Why should a Hardware store be run on a department basis?" and you can honestly ask, "Don't I make money enough to go to the Hardware convention and summer outing each year, get three regular meals a day, lay aside a little money and enlarge my stock each year?" Yes, that is all so, but would you not like to do all this a little more systematically and so you could know just how you did it.

Department means division and division means dividing up work and responsibility. Responsibility is a long word, and all you Hardwaremen recognize the meaning of it. How hard it is to get men to assume work and duties to relieve the head of the concern.

By dividing the responsibility and work we get a system which is the key to the above trouble.

On the size and conditions of a store depend the usefulness and adaptability of departments. Ordinarily a pro-

prietor having four to five clerks can keep track of his business in good shape, but when that number is increased and they are upstairs, downstairs, in the back store, side alleys, &c., it is hard work to keep in line.

The Usual Way of Running a Hardware Store

is to educate each and every clerk to know the entire stock in order that he can wait on any customer anywhere he may be called. Every clerk has his liking and they most all like to sell Jack Knives. You will agree that every man has a particular calling for some branch of the business.

The usual method of keeping up stock is to have a want book in which articles that the firm are low on may be put down as they are discovered by the different clerks, the proprietor generally ordering from this book if he does not find time to look over the stock himself. If someone forgets to make note of goods that are low how hard it is to find out who is to blame—most always the other fellow.

Then there is trouble in keeping the retail shelf boxes filled and also trouble in putting back goods taken down when shown to customers; also trouble on special prices made to friend customers, and trouble on goods returned or exchanged.

A Department Basis.

The method of starting in on a department basis is tedious and expensive, and just a word of advice; if you ever do it engage some expert to do it for you. All goods should be divided into groups, for example:

1, Nails, Tacks, &c.
2, Iron and Steel.
3, Machinists' Tools.
4, Carpenters' Tools.
5, Cutlery.
6, Builders' Hardware.
7, Paints, Oils, &c.
8, Blacksmiths' Supplies.
9, Agricultural Tools.
10, Roofing.
11, Miscellaneous.

This division looks plain and easy, but it is a question in some cases where to draw the line. Once divided, however, it is settled and the goods belong to the department they are named in.

Each Department Should Be Kept by Itself;

that is, the goods in each department should be separated from other departments. If the store is large enough and the trade warrants it, let one man have charge of each department. If not, then let one man take charge of two or three departments that may be of similar character.

For instance, one man can look after Machinists' Tools, Carpenters' Tools and Cutlery. Another man after Builders' Hardware and Nails, and another man after Iron and Steel and Blacksmiths' Hardware.

In our own business we have given each manager of department or departments full charge of same. He buys the goods or makes out requisitions for the office to send by mail. In other words, he buys the goods and is responsible to see that they sell. On new lines of any size they would consult with the house before placing any order.

These Managers Are Responsible

for the location of goods and marking of same, and just a word about marking the goods—each article and package is marked with number of department, cost and resale price of same. They must keep up their stock, and they will because they know no one else will.

They know where goods are located, and can tell the price without looking as a rule. In case the price is not in their mind, the price is on the article in their hand and not on a card, which they might otherwise have to look up.

Where the Traveling Man Comes In.

All of you know the value of a drummer's acquaintance. What a valuable man a traveling man is to the retailer. He always has new points and information to give free of charge. He should see the man that fires the gun. Many times a proprietor will buy goods of an enthusiastic representative who can give all the points necessary to resell the goods, even before they arrive, and how many times can he impart that same fire and brimstone to the clerks. Ten chances to one he will forget to mention it, and if he does it sounds second hand, and by the time the clerk gives it to the customer it is three times and out.

It interests the managers, however, to get these good talking points, as they can use them to move the goods, and each manager likes to make his department show the best, for he has a pride about it, and also knows it is for his interest, as the showing will appear before the man who makes out his payroll.

Cash and Credit Slips

are used similar to the regular department stores. These slips are made out with name of articles, number of department, selling and cost prices; also initial or number of clerk making sale. This may seem a long story, but once started it is easy. These slips are sent to the office where a clerk figures the profit on same by departments.

Results Each Day and Month.

At the end of each day you can see your total sales and the amount of profit by departments or total. Every month these departments are figured in such a way that you can tell the gross and net percentage of profit, and while a man knows, as a rule, that it costs 15 per cent. of net profit to run his store, he does not begin to realize it until he sees it in black and white on a piece of paper.

mportance of Knowing Co[illegible].

If the trade in general knew the cost of conducting business there would be less cutting of prices. If a department does not figure a profit that looks sufficient you can raise the prices to a point that will give it a showing, and if you find it does not pay then discontinue that class of goods. The inventory is also a story teller.

When a Department Is Started

the stock of same is taken and placed on record. To this is added the amount of goods bought and from the same the amount of goods sold is deducted. At the end of six months stock can be taken and if the inventory does not agree with the record in the office there are two reasons why. You have made a mistake or the goods have disappeared.

Another feature of figuring all sales is you can easily note any sales made at a small profit, as they show up on the sheet you figure the profit on. Many sales will show an error in the marking of goods, and in case goods are returned you can at once locate the man who sold them and find out the difficulty.

An important and interesting feature is to note the percentage of profit on different lines of goods. That line showing the most profit is the line to be pushed hardest.

Makes Plain Who's Who and What's What.

A department store is not, however, all milk and honey and there is trouble, as in any other place. It costs money to keep it up and if you lose a cog out of the system it has to be repaired the same as any other wheel. It does, however, decide the question who is who and what is what and places each man where he belongs, with a check on his work.

Reading Hardware Company's New Quarters.

THE Reading Hardware Company, New York, has about completed the arrangement of its new headquarters, at 50-52 Franklin street, being the latest acquisition to what is fast becoming a recognized Hardware district. The removal was accomplished about February 1, as then announced, the interval having been utilized in establishing the various departments permanently. The street floor and basement are each 92 x 48 ft., the former containing executive and general offices, inclosed sample room, wall cabinet sample cases, city and contract departments. The stock, packing and shipping rooms are on the floor below. The office of C. S. Packard, manager, is at the left in entering, and directly opposite on the other side is a room set apart for meetings or the use of officers of the company as occasion requires. Adjoining it is another well equipped space for high class contract work and estimating from specifications, blue prints, &c. Between these offices is a sample room, 24 x 29 ft., exceptionally well located and well lighted. The general offices for accountants, &c., occupy a space, 17 x 34 ft., about in the center of the floor, in front of which is a railed space, 10 x 17 ft., for the city department salesmen handling pick-up orders.

All Hardware and Electric Fixtures are of special design, and made to order in the company's own works, which with the ornamental metal grille work, hanging sign and outdoor front is in a Verde effect around a crystallized center, the general effect of which resembles old Belgian bronze. All partitions are of quartered oak and beveled glass, the furniture, desks and similar appurtenances being in harmony. There are many other business conveniences, such as electric bells and speaking tubes connecting the two floors, &c. Actual stock on hand is instantly ascertained without going off the floor by referring to records at the desks, which are kept accurate by adding goods received and deducting whatever goes out. The company is now carrying on the premises double the amount of goods formerly kept in stock at 96-98 Reade street.

THE COLONIAL CORDAGE COMPANY, Toronto, Canada, manufacturing Cordage and Binder Twine, has appointed C. K. Turner & Son, Inc., 116 Broad street, New York, its representatives to handle its products. They are equipped to give prompt and accurate information and have authority to quote lowest prices for export.

TRADE ETHICS.

Extracts from an address before the Nebraska Retail Hardware Association by Nathan Roberts, Omaha.

MOST of us make mistakes of the head rather than the heart. Remember that work is only a means and that character is the end. The first part of our business life I will touch on is dishonorable competition and its dire results.

Under this head there are many ugly phases, but I am glad to be able to state that the world is getting better, and what would have been considered fair some years back is now frowned on and cast upon the muck heap to rot with many other obnoxious odors. Men of brain and character to-day reflect upon ethical laws before doing that which only like the boomerang returns with twofold force to injure and destroy.

While competition is said to be the life of business, it is also certainly the death of many merchants. Are we aiming to avoid dishonorable competition, although its strenuousness sometimes strains integrity?

Baiting Our Competitor's Known Customers

in any way, I consider dishonorable, and especially so where baits are offered on goods in a standard class of market or known values at prices that net a loss. One doing this has for his only motive the discrediting of his competitor in the mind of his customer. This may bear fruit as intended, or your competitor may suffer in mental integrity and financial loss, but many years of observation in the retail business has taught me that the man who steals in this way will be before the bar of justice sooner or later for wrongdoing, and the customer gained in this manner will not net him any appreciable results in the growth of his business.

Closely allied to this form of piracy and, in fact, I believe first cousin to it, is the vicious habit of rash price cutting, which having the same object in view as baiting and carrying with it the same ulterior results, becomes the death of many merchants and is a direct violation of ethical laws.

Discounting Our Competitor's Character,

goods or mode of doing business, is dishonorable and non-ethical, and I fear many are our temptations along this line. But I am convinced that with the growth, influence and good fellowship of our association meetings, this unworthy phase of business experience is slowly but surely giving place to the nobler attribute of speaking well of them and their mode of business. This makes business life more pleasant and brings friends instead of enemies. Even our customers think better of us if we speak well of our competitors, and our practice of ethical laws bear luscious fruit.

Our Customers Are Largely Influenced

to or from us to the extent that we inculcate into our business the right spirit. Who can estimate the value of and advantage to be gained by a sunny, cheerful, friendly ethical disposition in our touch with the public? Do we make our customers interest our interest?

Does a sympathetic word and the glad hand cost us anything? Rather is it not one of our most valued assets? Did not the glad hand extended by Peter at the gate beautiful to the lame beggar raise him to his feet and set him dancing and shouting for joy?

What a privilege is ours for the using. We do not mean to be dishonest, but nevertheless we are practicing from day to day methods and manners that shown forth in the limelight of ethics would surprise us were we to see ourselves as others see us.

I refer to the petty incongruities of speech and manner of dealing with the public. An article is not good because you have fallen into the habit of saying it is; a price is not the best because you say so; an article may be of full value for the price asked, or price may be as low as you will sell it for. I believe the public should know exactly the merits or demerits of any article they wish to buy, and only to the extent to which we practice this spirit will the public have confidence in our integrity. Let us deliver the goods; that is what counts.

Relations with Jobber and Manufacturer

Our dealings with the distributers of goods, whether jobber or manufacturer, are not always in accordance with the true spirit of moral philosophy. Do we not often find ourselves looking for causes of complaint where none exist or are so trifling that they are scarcely worthy of consideration? Is the spirit in which we enter these claims not tainted with a desire to get something for less value than that agreed upon? Let us be just to all, and we will be just to ourselves.

Discounting Bills

at the time limit for such discounts, is, I hope, a favored pastime with many of you. I believe it is wrong and unjust and a breach of contract to allow remittances to lapse over the time specified, and I believe should we for any reason let the time pass it is more honorable to let it rest until maturity.

It is true that jobbers, manufacturers and others practice things in their trade dealings that are not always just or even have a semblance of right, but they are few and far between, and is it proper that we should play with fire by imitating them? Rather should we not set them an example of true ethical principles in all our dealings and so raise the business world to even a higher standard than it now enjoys?

Moral Truth,

or conformity of word to thought is a fixed ethical principle, and is it not a fact that the lack of it to a more or less extent in all of us becomes a millstone about our necks, which if not corrected will sooner or later drown us in the sea of mercantile oblivion.

Need I point to the temptation that comes to us daily in buying or selling, trading or bartering, to refrain from giving expression in words to the thoughts of the heart. Shrewdness may be the quality of nice discernment, but it has no place in the man of moral ethical principles.

Selling to the Retailer's Customers,

Before I close this paper I must touch on an ethical proposition from the other fellow's viewpoint. I refer to the attitude of the jobber and manufacturer toward the man who finds a market for their wares. Is it right, just and ethical that parties who depend upon, and look to you and I to find a market for their goods to sell anything great or small to the consumer that you have created and fostered as a channel for the merchandise that you buy of him? If he continues in his methods, together with the inroads made by our friends, the mail order house, we will arrive at that deplorable condition of old Mother Hubbard's poor dog.

Integrity, Truth, Fairness.

In getting together these few rambling thoughts, I will have attained the object in view should some one at least find suggestion, inspiration or instruction, something he can take home, apply and receive good from. I love the Hardware business, and it has always afforded me at least a pleasure, if not at all times a profit equal to the energy put forth. I plead for higher ideals in our business methods, a closer regard to living by the strictest conception of the meaning of integrity, truth and fairness. I wish that each and every one of us may so live as to uplift and ennoble the business, so that when we shall have crossed the great divide it may be truly said of us that the business in which we were engaged and the world at large is better for our having been in it.

KLEIN & CARTER, White Plains, N. Y., have purchased a building on the corner of Railroad and Lexington avenues, which they will remodel to accommodate their growing Hardware business. The firm carries Builders' and General Hardware, Sporting Goods, Cutlery, &c., and makes a specialty of warm air heating, sheet metal work, roofing and job work. When alterations are completed the firm expects to have one of best appointed Hardware stores in Westchester County.

SAMUEL H. BIGELOW, Bigelow & Dowse Company, Boston, Mass., has returned to business after an absence of several weeks, due to ill health. Mr. Bigelow's illness caused much anxiety among his many friends and all are happy to see him restored to his usual health.

Keuffel & Esser Company's 1909 Catalogue.

THE Keuffel & Esser Company, 127 Fulton street, New York, with general offices and factory at Hoboken, N. J., has issued the thirty-third edition of its catalogue, referring to its extensive line of Drawing Materials, Surveying Instruments, Measuring Tapes and Draftsmen's Supplies. The book, of 560 pages, is a marked advance on previous editions, is substantially bound and effectively illustrated in colors. An important change in general arrangement is found in the creation of a special section for drafting office furniture, which is now regarded as an important line of manufacture. Interspersed throughout the book are illustrations showing the interior of the general office and factory buildings at Hoboken, as well as glimpses of the company's branch stores in New York, Chicago, St. Louis, San Francisco and Montreal. The entire book has been copyrighted anl, in addition, separately, about 400 illustrations and much of the text have been copyrighted.

Cashing Salesmen's Checks.

THE following crisp and suggestive letter is from a well-known New England house:

We have a favor to ask manufacturers and jobbers in behalf of all Hardware dealers. It is this:

Please do not send out new men among strangers to get your personal or firm checks cashed. It is "rough" on the men, as it is decidedly unpleasant to ask favors of strangers, and it is annoying to dealers, because if they refuse they feel hard hearted, while if they comply they feel "soft headed." The custom is wholly unbusinesslike and should be discontinued.

The Universal Washing Machine.

The Rotary Washing Machine Company, 5223-5225 McKissock avenue, St. Louis, Mo., is offering the washing machine shown herewith. It can be operated in either sitting or standing position. The gearing remains connected whether the lid is open, closed or in an intermediate position. Operating the lever gives a fast motion for all ordinary washing, while the flywheel is used to obtain a slow motion for washing delicate articles, such as laces, &c.

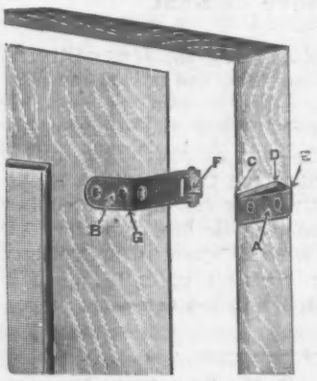
The Universal Washing Machine.

Steiner's Family Motor.

The Steiner Mfg. Company, St. Louis, Mo., successor to the American Stove & Queensware Company, is the manufacturer of Steiner's family motor which has been described and illustrated in our columns in connection with the operation of freezers, sewing machines, meat choppers, &c. A special point is made by the company of the adaptability of the motor to the operation of washing machines. The company furnishes a complete family outfit, consisting of one motor complete with 6 ft. of cord and switch plug, one washing machine, one wringer, one sewing machine attachment and one meat and vegetable cutter.

The P. & H. Screen Door Catch.

The device here illustrated is designed to hold screen doors tightly closed without the use of a hook and eye, and at the same time prevent rebounding and rattling when shut. It is put on the market by Peck-Hamre Mfg. Company, Berlin, Wis., and is made in two parts; that constituting the catch being stamped from cold rolled steel, while the hasp or retaining arm is produced in like manner from lock spring steel. The latter carries a steel roller, F, which on closing passes over the beveled surface of the catch, and, dropping into the bevel D to E, reduces the slam of the door and holds it snug and tight. The weight of the catches is 17 lb. to the gross. They are packed one dozen in a pasteboard box, each catch being put up in an envelope with its screws.



The P. & H. Screen Door Catch.

The Goodell-Pratt Bit Brace Extensions.

The Goodell-Pratt Company, Greenfield, Mass., is offering the bit brace extension shown herewith. The tool consists of two pieces, the shank and a loose sleeve with milled opening, through which the shank of the bit is inserted. The loose sleeve operates on a very fine thread, which insures a strong and positive grip upon the shank of the bit. The extensions are made in two sizes, one in five lengths for following ⅝-in. bits, and the other in two lengths for following ¾-in. bits. The tools are strongly and thoroughly made and well finished.

The Goodell-Pratt Bit Brace Extensions.

Steinfeld Food Chopper.

Steinfeld Bros., 620 Broadway, New York, have put on the market the Steinfeld food chopper here illustrated. As shown by Fig. 2 the cutting is done by a single self-sharpening part, and by means of the clamp adjustment it will cut coarse, medium, fine and extra fine, according

Fig. 1.—Steinfeld Food Chopper.

Fig. 2.—Cutting Member.

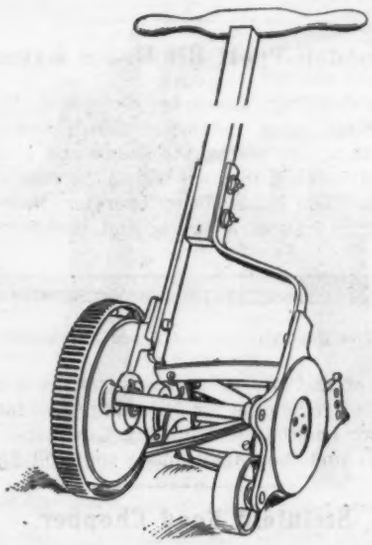
as the cutter is moved forward or back. The point is made that there are no knives to adjust, sharpen or lose, the adjustment being effected by setting the clamp nearest the crank at coarse, medium or fine cast in the one-piece body of the chopper, which, by it following the curved rib advances or recedes the cutter, so that the opening at the end, is larger or smaller as desired, thereby regulating the size of the cut product.

Dixon's Stove Cement.

The Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Reade street, New York, has put on the market Dixon's stove cement, which is used for repairing broken stove or range brick linings and economically making them practically as good as new. It is in the form of a dry, coarse powder, and the addition of a little water makes it instantly ready for use. It requires but little time to dry, and may be fired quickly after using. For rapid drying a small quantity of molasses may be added to the water. It is put up in 2½, 6 and 10 lb. packages, in cases of 3, 1 and 1 dozen each, respectively.

The Pennsylvania Ball Bearing Lawn Trimmer.

The Supplee Hardware Company, Philadelphia, Pa., has added to its line the ball bearing lawn trimmer shown herewith. It is in effect a miniature Pennsylvania mower and has an 8-in. drive wheel on the right hand side, with a small guide wheel on the left hand side, enabling the user to cut close to walls, fences, trees, &c., thus removing the grass that is left after mowing with an ordinary machine. The trimmer is designed to do away with the use of grass hooks, sickles and shears.



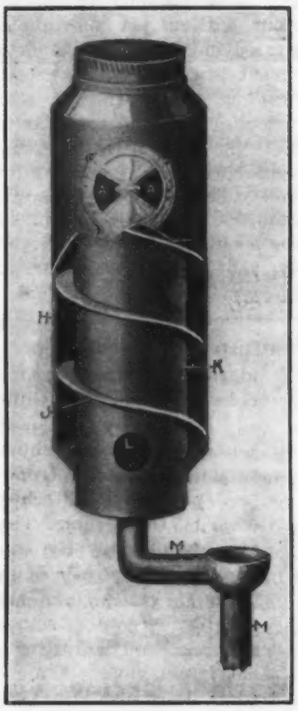
The Pennsylvania Ball Bearing Lawn Trimmer.

F. E. Kohler & Co.'s Trowels.

F. E. Kohler & Co., Canton, Ohio, are manufacturing a line of trowels, including plastering, brick and pointing trowels, made from bright cold rolled steel, with tinned steel shanks and varnished hardwood handles. The tinned shanks and varnished handles are referred to as increasing the attractiveness of the goods, which are also nicely packed.

The Pyrozone.

The Waterbury & Brown Mfg. Company, Minneapolis, Minn., is offering a device for producing more nearly complete combustion, which can be attached to any stove or heating plant, replacing the first length of pipe. Its various parts are shown by the accompanying illustration. There are two pipes, one within the other, with a ½-in. air space between them. The surrounding air is drawn in through the draft regulator A in the outside pipe, and is carried downward around the hot inside pipe K, around the inner pipe by the spiral wall J. The inner pipe being hot materially warms the air, which at the end of the spiral air chamber enters through the opening L into the hot blast pipe M, and is conducted into the midst of the fire. The air by the time it reaches the fire has become heated to practically the same temperature as the gases escaping in the smoke, and, consequently, it is explained, causes them to be consumed, thus increasing the efficiency obtained from the fuel. It is said to burn the coal to a white ash, leaving no clinkers, and removes the danger of explosions. An additional merit is claimed for it in that it prevents creosoting and permits the use of a cheaper fuel without smoking or clogging the chimney.



The Pyrozone.

Pocket Screw Driver.

The L. S. Starrett Company, Athol, Mass., and 132 Liberty street, New York, has just brought out the Pocket screw driver, No. 560, for electricians and others, here shown. It is similar to the No. 557, except that the handle is covered with hard rubber for insulation from electrical currents, and is ribbed lengthwise to insure a firm grip in use. The four blades, each 3-32, 5-32, ¼ and ⅜ in. wide are carried in the handle, and prevented by spring pressure from rattling or loss when the telescope handle is detached from the barrel. The handle is ⅞ in. in diameter, and the blade holding section ¾ in. in diameter, one fitting the other on a taper, friction tight, but quickly separable by a twist.

Insulated Pocket Screw Driver for Electricians.

The 400 Steel Level, Plumb and Rule.

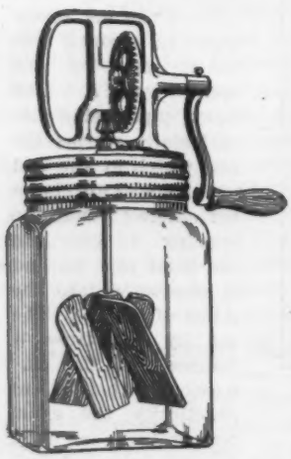
The Southington Hardware Company, Southington, Conn., New York office, C. E. Jennings & Co., 42 Murray street, is putting out the 400 steel level, plumb and rule, here reproduced. It is 24 in. long, 2¾ in. wide and ⅛ in. thick, graduated to one-eighths and one-fourths, and made of high carbon steel, accurately squared, ground and graduated. The tubular level glasses are mounted in heavy brass adjustable open caps 2 5-16 in. in diam-

eter, the spirit bubble being equally visible from either side. As the steel plate is unobstructed and flat on the back, it may be screwed on to a straight edge for leveling. In lining up shafting it may be hung by means of hooks to the shafting for determining results. From the

The 400 Steel Level, Plumb and Rule.

nature of the tool it occupies but little space, and is packed singly in a pasteboard box. It is marketed in gun metal finish with oxidized copper caps, and in nickeled body with brass or oxidized copper caps.

The Dazey Family Churn.

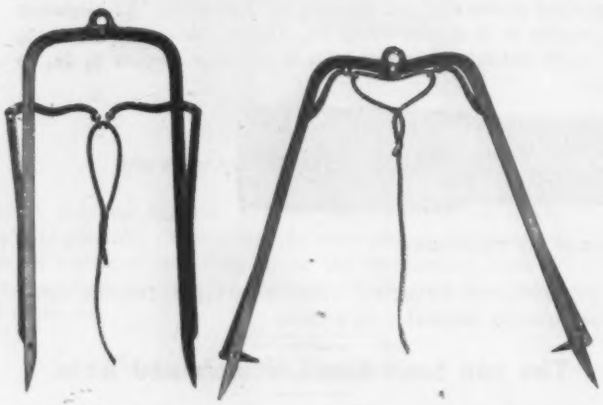


The Dazey Family Churn.

The accompanying illustration represents a glass churn made in four sizes by the Dazey Churn & Mfg. Company, St. Louis, Mo. The churns range in capacity from 3 to 9 pints and will churn from 1½ to 4½ pints. They are described by the company as being made of the highest grade material, durable, easy and smooth running, and affording a maximum yield. Made of glass, they are said to be easily cleaned and perfectly sanitary, having nothing to absorb the butter fat and become rancid. The castings are heavy and the turbine dasher secures increased agitation and quick results. Larger sizes not made of glass have a capacity of 3 and 6 gal., respectively.

Myers' Improved Grappling Harpoon Hay Fork.

F. E. Myers & Bro., Ashland, Ohio, are introducing the hay fork shown herewith. The left hand illustration represents the fork ready to penetrate the hay before drawing up from the wagon into the mow. On the right is indicated the manner in which the fork tines spread when the fork is pushed into the hay, thus increasing the spread of the fork from 19 to 42 in., and more than doubling its capacity. The capacity of the fork is further increased by the elimination of a cross bar, which permits the hay, when the fork is forced into it, to crowd up to the cross head of the fork, and also acts as a self-closing device by throwing the levers apart and setting the barbs to the position required for holding the hay when the fork is being elevated from the wagon to the mow. The trip levers have a friction hinge, so that the fork always returns to the wagon with the barbs pocketed ready to reload. Owing to the manner of threading the rope controlling the trip levers, the fork can be tripped from any angle, and, it is claimed, considerably easier than the old style double harpoon fork. A double harpoon hay fork is also made to which the above description applies, except that it does not have the tine spreading feature. Both styles of fork are constructed of buggy spring steel, extra weight, with malleable levers and barbs.



Myers' Improved Grappling Harpoon Hay Fork.

Robertson's Royal 1909 Power Saws.

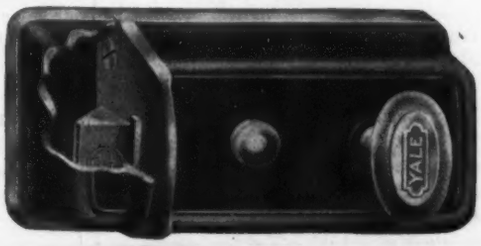
The power saw shown herewith, manufactured by the Robertson Drill & Tool Company, 1848 Niagara street, Buffalo, N. Y., is referred to as embodying all the modern ideas of a high-class tool designed for use in the most exacting works. All surfaces are milled, and where practical tongue and grooves are used to insure perfect alignment, gigs and special tools being used and every part being interchangeable. The base or bed is secured to the legs by cap screws. The head is a box pattern, having a 2½ x 5½ in. journal, reamed through which a bearing cast on the saw or swing carriage is mounted and provided with a split clamp collar for adjustment. On the swing carriage are bearings and caps milled to size for the square steel sliding bar to which the frame is connected. The drive shaft on which the crank arm is connected has its bearing through the swing carriage casting. One end is keyed to spur gear, and the other end to the adjustable crank arm. With the arm a variation of

Robertson's Royal 1909 Power Saw, No. 3.

strokes can be had from 4 to 9 in. The bed is lowered where the vise is located. This allows the saw on starting a capacity cut, 8 x 8 in., to be on a good cutting angle, and increase its pressure as the cut is completed. The saw is relieved on the return stroke. The feed is gravity, and is provided with means for increasing pressure as the saw wears. The vise on the machine has a swivel jaw, also the vise swivels on the bed and is graduated to 45 degrees. The vertical handle shown back of the swing carriage is used to hold the frame up while placing new work in the vise. The handle operates a notched lever that holds the frame by inches at any hight within its capacity. The frame can also be raised to a vertical position, thus providing ample space for handling large work operated with a crane, &c. For cutting all kinds of bars within its capacity the machine is guaranteed by the company in every respect, being extra heavy at all points where it is subject to strain or vibration. The length of blade is 14 to 17 in.; strokes, 60 to 70 per minute. The company also makes a high-speed machine furnished with a front tank leg for holding a lubricant which is pumped to the saw, the pump being located on the head, and geared to the drive pinion, which operates the pump only while the saw is cutting. The bed is provided with a gutter to catch the lubricant, and return it to the tank for reusing, otherwise the machine is the same in construction as the regular No. 3, illustrated.

New Yale Deadlocking Night Latch.

The Yale & Towne Mfg. Company, 9 Murray street, New York, has just put on the market the Yale rim night latch, No. 44, here illustrated. It is said to be as great an advance in night latch construction as Linus Yale, Jr.'s, invention of the pin tumbler lock was in lock construction. It combines the convenience of a spring latch with the positive security of a dead bolt. This dual result is obtained by means of a "protector," which, while not affecting the retraction of the bolt by contact with the strike, is prevented by its greater width from entering the latter, and while held back in this position dogs the latch bolt, so that the bolt is proof against attack even though it may be exposed by the shrinkage of the door. The lock has, therefore, all the convenience of an ordinary night latch—*i. e.*, it can be locked by merely closing the door, and all the security of a dead lock when the door is closed. The iron case is 3½ x 2⅜ x 1¼ in., old copper finish, with front and bands polished. The pin tumbler, cylinder, knob, latch bolt and protector are of bronze. Three paracentric, nickel-bronze keys, coined, with gold plated bows, are packed regularly with each lock. The back set, or distance from edge of lock to center of cylinder, is 2⅜ in., and the locks are suitable for doors ⅞ to 2½ in. thick. They are reversible for doors of either hand and may be obtained to order for doors opening and requiring the reversed bevel latch. They can be master keyed if desired. Like the No. 42 latch, made by the company, this lock when fitted and the door is closed has no screws visible or where they can be reached. The lock case is held by a steel plate screwed to the door, the case being fastened to that by end machine screws. The strike is likewise secured by end screws.



Yale Deadlocking Night Latch, No. 44, with Strike Cut Away.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—	℔ gal bbls.
Linseed, Western, Raw	.55 @56
State, Raw	.55 @56
City, Raw	.56 @57
Boiled, 1c ℔ gal. advance on Raw.	
Raw, Calcutta, in bbls	.75 @..
Lard, Prime, Winter	.78 @80
Extra No. 1	.56 @..
No. 1	.48 @..
Cotton-seed, Crude, f.o.b. mill	.32½@33½
Summer, Yellow, prime	.5.50@5.60
Summer, White	.5.75@5.85
Yellow, Winter	.6.00@6.20
Tallow, Acidless	.56 @..
Menhaden, Brown, Strained	.33 @..
Northern Crude	@..
Southern	.24 @25
Light Strained	.33 @..
Bleached Winter	.36 @..
Cocoanut, Ceylon	℔ lb 6¼@ 6⅝
Cochin	℔ lb 6⅞@ 7
Cod, Domestic, Prime	.36 @..
Newfoundland	.38 @39
Red Elaine	.43 @47
Saponified	℔ lb .. @ 6¼
Olive, Yellow	.$1.50@1.60
Neatsfoot, Prime	.57 @..
Palm, Lagos	℔ lb 6½@ 6¼

Mineral Oils—	℔ gal.
Black, 29 gravity, 25@30 cold test	.13 @13½
29 gravity, 15 cold test	.13½@14
Summer	.12½@13
Cylinder, light filtered	.20½@21
Dark, filtered	.18 @19
Paraffine, 903-907 sp. gravity	.14½@15
903 sp. gravity	.13½@14
883 sp. gravity	.11 @11¼
Red	.13½@14

Miscellaneous—	
Barytes:	
White, Foreign	℔ ton $18.50@20.50
Amer., floated	℔ ton 17.00@18.00
Off color	℔ ton 12.50@15.00
Chalk in bulk	℔ ton 3.00@ 3.40
China Clay, Imported	℔ ton 11.50@18.00
Cobalt, Oxide	℔ 100 lb 1.45@ 2.60
Whiting, Commercial	℔ 100 lb 45@50
Gilders	℔ 100 lb .52@ .64
Ex. Gilders	℔ 100 lb .56@ .68

Putty, Commercial—	℔ 100 lb
In bladders	$1.70@2.00
In bbls. or tubs, 100 lb	1.20@1.45
In 1 lb to 5 lb tins	2.65@3.25
In 12½ to 50 lb tins	1.50@1.90

Spirits Turpentine—	℔ gal.
In Machine bbls	40½@41
In Oil bbls	41 @41½

Glue—	℔ lb
Cabinet	.12 @15
Common Bone	.7½@ 9
Extra White	.18 @24
Fish, liquid, 50 gal. bbls., per gallon	.60 @1.30
Foot Stock, White	.12 @14
Foot Stock, Brown	.9 @11
German Common Hide	.10 @12
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.10 @12
Medium White	.14 @19

Gum Shellac—	℔ lb
Bleached, Commercial	.17½@18
Rone Dry	.22 @23
Button	.20 @30
Diamond I	.33 @34
Fine Orange	.23 @24
A. C. Garnet	.17 @18
G. A. L. Garnet	.16 @17
Kala Button	.12 @13
D. C	.33 @34
Octagon B	.25 @28
T. N	.15½@17
V. S. O	.31 @32

Colors in Oil—	℔ lb
Black, Lampblack	.12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.@24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White and Red, Lead &c.—	℔ lb
Lead, English white, in Oil	.10½@10⅝
Lead, American White:	
Dry and in Oil, 100, 250 and 500 lb kegs	6¾
Dry and in Oil, 25 and 50 lb kegs	7
Dry and in Oil, 12½ lb kegs	7¼
In Oil, 25 lb tin pails	7¼
In Oil, 12½ lb tin pails	7⅝
In Oil, 1, 2, 3 and 5 lb tin cans, asst	8¾
Red Lead and Litharge:	
In 100 lb kegs	7
In 25 and 50 lb kegs	7¼
In 12½ lb kegs	7½
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.	
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.	

Zinc, Dry—	℔ lb
American, dry	5¼@ 5⅝
Red Seal (French process)	6¾@ 7
Green Seal	7¼@ 7½
German Red Seal (French process)	7 @7¼
Green Seal	7⅛@ 7⅜
White Seal	8¼@ 9
French, Red Seal	8⅜@ 8¾
Green Seal	10⅜@10⅝

Dry Colors—	℔ lb
Black, Carbon	.6¼@10
Black Drop, American	.3½@ 8
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, commercial	.4 @ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.30 @31
Blue, Prussian, Domestic	.28 @30
Blue, Ultramarine	.5 @15
Brown, Spanish	½@ 1
Carmine, No. 40	.$3.00@3.10
Green, Chrome, ordinary	.3½@ 5
Green, Chrome, pure	.17 @25
Ocher, American	℔ ton $12.00@15.00
American Golden	.4 @ 5
French	.1¾@ 2
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	.12¾@13
German	.12 @13
American	.8½@10
Red, Indian, English	.5 @ 7
American	.3 @ 3½
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	℔ 100 lb $0.75@1.50
English	℔ 100 lb $1.15@1.60
Sienna, Italian, Burnt and Powdered	.3 @ 9
Italian, Raw, Powdered	.3 @ 7
American, Raw	.2¼@ 3
American Burnt and Pow'd	.2¼@ 3
Talc, French	℔ ton $18.00@25.00
American	℔ ton 15.00@25.00
Terra Alba, French	℔ 100 lb .80@1.00
English	℔ 100 lb .90@1.00
American	℔ 100 lb, No. 1, .75@ .80
American	℔ 100 lb, No. 2, .60@ .65
Umber, Turkey, Bnt. & Pow.	.2½@ 3
Turkey, Raw and Powdered	.2½@ 3
Burnt, American	.2 @2¼
Raw, American	.2 @ 2½
Yellow, Chrome, Pure	.12¾@14
Oxide Red, American	.2 @ 7½
Vermilion, English, Imported	.@70
Chinese	.$0.90@1.00

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND CLASS MATTER

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Columbian and Domestic.....33⅓%
North's 10%
Upson's Patent, ₱ gro., $29.90.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....10%
Ives' Stop Bead Screws and Washers 10%
Taplin's Perfection.....10%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—
Fernald Mfg. Co. Burton Anti-Rattlers, ₱ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ₱ doz. pairs .....$2.00@$3.00

Anvils—American—
Eagle Anvils.....₱ lb @8 ¢
Hay-Budden, Wrought.....9¼@9¾ ¢
Trenton .....₱ lb 9¼@9¾ ¢

Imported—
Swedish Solid Steel Paragon, ₱ lb .....10@10½ ¢
Swedish Solid Steel Sisco, Superior, ₱ lb.....10@10½ ¢
Peter Wright & Sons, ₱ lb, 84 to 349 lb. 11¢; 350 to 600 lb, 11½¢.

Anvil, Vice and Drill—
Millers Falls Co., $18.00.....15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co.....10%

Augers and Bits—
Com. Double Spur.....80%
Jennings' Patn., Bright.65&10@70%
Black Lip or Blued...65@65&5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conard's 35%
Forstner Pat. Auger Bits.....35%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list. 25&7½%
No. 30, R. Jennings' list.....50%
Russell Jennings'.....25&15&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits..... ...50%
Swan's .....65&10@70%
Swan's, Jennings' Pattern.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18.....60&10%
Ford's, Clark's Pattern...60&5@60&10%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....60&10%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dbl. Cut.....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$5.50@6.00
Ames .....20&10%
Universal 20%

Ship Augers and Bits—
Ship Augers.....40&10@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' .....33⅓&7½%
Snell's 60%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Rocket..gro.$11.50@12.00
Elmore Tool Mfg. Co.:
Tinners' and Brad Awls.....55&7%
Scratch Awls.....60%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—
See *Grease, Axle.*

Axles—
Iron or Steel.
Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar....4½@5 ¢
No. 1 Common, Loose...3½@4 ¢
No. 1½ Com., New Style.4¼@4¾¢
No. 2 Solid Collar.....4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12.....70%
Nos. 13 to 14.....70%
Nos. 15 to 18...70&10@70&10&5%
Nos. 19 to 22...70&10@70&10&5%

Boxes, Axles—
Common and Concord, not turned .....lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent.....lb., 9½@10¢

Bait—
Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—
Sash—
Caldwell new list.....50&10%
Pullman .....50&10%

Spring—
Light Spring Balances..60@60&5%
Chatillon's:
Light Spg. Balances.....50@50&10%
Straight Balances.....40@40&10%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars—
Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¼@2½¢

Towel—
No. 10 Ideal, Nickel Plate..₱ gro. $8.50

Beam, Scale—
Scale Beams.....40%
Chattillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters,
Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₱ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ₱ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned.....₱ doz. $1.50

Beaters Egg-
Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $4.50; No. 2, Family Size, $7.50; No. 3 Extra Family Size, $24.00; No. 4, Hotel Size, $30.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. L, Jap'd, $1.85 No. 6, Jap'd, $1.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $3.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—
Blacksmith, Standard List:
Split Leather.....60&10@65%
Grain Leather.....50@30&10%

Hand—
Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$5.00*	*5.50*	*6.00*	*6.50*	*7.50*

Molders—
Inch..	*10*	*12*	*14*	*16*
Doz..	*$7.50*	*9.00*	*12.00*	*15.00*

Net Prices.

Bells—
Cow—
Wrought Cow Bells.....75%
Jersey .....75&10%
Texas Star.....50%

Door—
Home, R. & E. Mfg. Co.'s.....55&10%

Hand—
Polished, Brass.....60@60&10%
White Metal.....60@60&10%
Nickel Plated.....50&10%
Swiss .....50&10%
Cone's Globe Hand Bells.....33⅓@35%

Miscellaneous—
Farm Bells.....lb., 2¼@2½¢
Church and School....60@60&10%

Belting—
Leather—
First Quality, Ex. Hy., Strictly Short Lap.....60&10%
Standard .....70&10@70&10&5%
Light Double.....75&10%
Cut Leather Lacing.....45@50%
Leather Lacing Sides, per sq. ft.25¢

Rubber—
Competition (Low Grade), 70&10@75%
Standard .....60&10@70%
Best Grades.....40@50%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son & Co.'s 1908 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks
Tackle—
Common Wooden.....75@75&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—
Paper and Wood Lined.....55%
Embossed 55%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓&10%

Bolts
Carriage, Machine, &c.—
Common Carriage (cut thread): ⅝ x 6 and smaller.....75&5%
Larger and longer.....70&10%
Common Carriage (rolled thread): ⅜ x 6, smaller and shorter, 75&10&5%
Phila. Eagle, $3.00 list...80@—%
Bolt Ends, with C. & T. Nuts, 70&10&5%
Machine (Cut Thread): ⅝ x 4 and smaller....75&10&5% Larger and longer....70&10&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch ...	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:
Inch	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:
Inch	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japanned, 80&10@80&10&5%
Barrel Bronzed.....60&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square .....70&10&10@80%
Ives' Mortise.....10%
Ives' Wrought Metal.....10%

Expansion—
F. H. Evans' Crescent.....40@60%
Richards Mfg. Co.....55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type..60&10&5&2½%
Star, Wood Screw Type.....40%
Star, Machine, Single Wedge....60%
Star, Machine, Double Wedge....60%
Steward & Romain Mfg. Co.:
Style No. 13, Double.....60%
Style No. 1, Single.....60%
Style No. 100, Dbl. Jaw, Single..55%
Lag Screw.....66⅔%

Plow and Stove—
Plow .....65&5@70%
Stove .....85@85&5%

Tire—
Common Iron.....80%
Norway Iron.....80%
American Screw Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84..82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. '84.....80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99...80%
Phila., Eagle, list Oct. 16, 1881..82½%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—
Borers Bung, Ring, with Handle:
Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch.....	*2¼*	*2½*		
Per doz.....	*$8.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 45%

Braces—
Common Ball, American.$1.50@$1.75
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 61, 166, 206, 614.....50%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat....60&10%

Brackets—
Wrought Steel.....80@80&5%
Bradley Metal Clasp...80&10@80&10&5%
Griffin's Pressed Steel.....75@75&10%
Griffin's Folding Brackets.....70&10%
Taplin Victor Handy Egg Beater Bracket .....₱ doz. $1.50

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co.....75&20%
Wire Goods Co.....75%

Buckets, Galvanized—
M'fr's list, price per gross.				
Quart..	*10*	*12*	*14*	
Water, Light.	*$28.35*	*30.75*	*34.75*	
Water, Ex. Hvy.	*46.85*	*49.35*	*53.25*	
Fire, Rd. Btm.	*33.50*	*35.90*	*39.90*	
Well	*37.35*	*41.35*	*45.35*	

10&7½&5&5%

Bull Rings—See *Rings, Bull.*

Butts—
Brass—
Wrought, High List, Oct.26,'06.65%
Cast Brass, Tiebout's.....40&10%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—
Bright.
Light Narrow, Light Reversible .....75&5%
Reversible and Broad.75&10%
Loose Joint, Narrow, Light Inside Blind, &c.....75%
Back Flaps, Table Chest.70% Japanned.
Light Narrow, Loose Pin, 40&5%
Light Narrow, Ball Tip...60%
Broad .....40&5%
Steeple Tipped.....70%
Ball Tipped.....70%

Extra, 10 @—

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800.... 30%
Hendryx Enameled..... 35%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel..... 4¾¢
Lautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See *Openers, Can.*

Caps, Percussion—

Eley's E. B...... 52@55¢
G. D...... *per M* 35@35¢
F. L...... *per M* 40@40¢
G. E...... *per M* 48@50¢
Musket ..... *per M* 62@63¢

Primers—

Berdan Primers, $2 per M.. 20¢
Primer Shells and Bullets.. 15&10%
All other primers per M.. $1.52@1.60

Carpet Stretchers—

See *Stretchers, Carpet.*

Cartridges—

Blank Cartridges:
32 C. F., $5.50..... 10&5%
38 C. F., $7.00..... 10&5%
22 cal. Rim, $1.50..... 10&5%
32 cal. Rim, $2.75..... 10&5%
B. B. Caps, Con. Ball, Swyd. $1.90
B. B. Caps, Round Ball..... $1.49
Central Fire..... 25%
Target and Sporting Rifle. 15&5%
Primed Shells and Bullets. 15&10%
Rim Fire, Sporting..... 50%
Rim Fire, Military..... 15&5%

Casters—

Bed ..... 65&10@70%
Plate ..... 60@60&5%
Philadelphia ..... 70&10@75%
Acme, Ball Bearing..... 35%
Gem (Roller Bearing)..... 70&10&10&5%
Steel Gem (Roller Bearing)..... 70%
Standard Ball Bearing..... 45%
Yale (Double Wheel) low list... 40&10%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	½	⅝
$7.45	4.80	3.85	3.25	3.10	3.00

¾-⅞-1 1⅛ to 1¼ inch.
$2.90 3.00
In cask lots, deduct 25¢.
German Coil..... 70&5%
German Pattern Coil:
6-0 to 1..... 70&10&5%
2 and 3..... 60&10&10@70%
4, 5 and 6..... 50&10@50&10&5%

Halter—

Halter Chains..... 60&5@60&10%
German Pattern Halter Chains, list July 24, '97..... 70&5%
Covert Mfg. Co.:
Halter ..... 35&5%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Straight, with ring. $26.00
6½—6-2, Straight, with ring. $27.00
6½—8-2, Straight, with ring. $30.00
6½—10-2, Str'ght, with ring. $35.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c: No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c..... 70%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ..... 60&10&5@60&10&10%
Brass 65%
Safety and Plumbers' Chain. 75%
Gal. Pump Chain.... *lb.*, 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil. 35&2½@40%
Triumph Dog..... 50&10@60%
Brown Halter and Coil.... 45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion 40%
Oneida Community:
American Halter, Dog and Kennel Chains ..... 35&2½@40%
Niagara Dog Leads and Kennel Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain..... 70%
Universal Dbl.-Jointed Chain.... 70%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain..... 60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered ..... 60&10%
Sash Chain Attachments, per set.. 8¢
Aluminoy Sash Ribbon, per 100 ft. ..... $2.00@$5.00
Sash Ribbon Attachments, per set.. 8¢

Chalk—

Carpenters' Blue..... *gro.*, 50¢
Carpenters' Red..... *gro.*, 50¢
Carpenters' White..... *gro.*, 40¢

Checks, Door—

Bardsley's 45%
Pullman, per gro..... $54.00
Russwin 33⅓%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools..... 55%
Youths' Chests, with Tools..... 40%
Gentlemen's Chests, with Tools.. 30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty..... 45%
Tool Cabinets..... 45%
C. E. Jennings & Co.'s Machinists' Tool Chests..... 7½%

Chisels—

Socket Framing and Firmer

Standard List.. 80&10@80&10&10%
Buck Bros..... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10..... 25&7½%
Socket Framing No. 15..... 25&7½%
Swan's ..... 66⅔@70%
L. & I. J. White & Co..... 30@30&5%

Tanged—

Tanged Firmers..... 30&5@35%
Buck Bros..... 30%
C. E. Jennings & Co. Nos. 191, 181.. 25%
L. & I. J. White Co..... 25&5%

Cold—

lb.
Cold Chisels, good quality.. 13@15¢
Cold Chisels, fair quality.. 11@12¢
Cold Chisels, ordinary.... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels..... 50&5%

Chucks—

Almond Drill Chucks..... 35%
Almond Turret Six-Tool Chuck..... 40%
Beach Pat, each $8.00..... 35&5%
Empire 25%
Blacksmiths' 25%
Jacobs' Drill Chucks..... 35%
Pratt's Positive Drive..... 25%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws..... 35%
Universal, Com. Style Jaws..... 40%
Combination, Reversible Jaws..... 35%
Combination, Com. Style Jaws.. 40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks..... 25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ... 25%
Positive Drive..... 40%
Planer Chucks..... 20%
Standard 45%
Drill Press Vises..... 30%
Face Plate Jaws..... 35%
Standard Tool Co.:
Improved Drill Chuck..... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21..... 35%
Scroll Combinations, Nos. 83 and 84 ..... 30%
Geared Scroll, Nos. 33, 34 and 35.. 25%
Independent Iron, Nos. 18 and 318. 35%
Independent Steel, No. 64..... 25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104..... 35%
Union Czar Drill..... 25%
Universal, 11, 12, 16, 17, 13, 14, 15.. 40%
Universal No. 42..... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50..... 35%
Steel Face Plate Jaws, Nos. 70 and 72 ..... 30%
Westcott Patent Chucks:
Lathe Chucks..... 50%
Little Giant Auxiliary Drill..... 50%
Little Giant Double Grip Drill... 50%
Little Giant Drill, Improved..... 50%
Oneida Drill..... 50%
Scroll Combination Lathe..... 50%
Whitaker Mfg. Co.:
National Drill..... 25%

Clamps—

Carriage Makers', Star, P., S. & W. Co. 50%
Besly, Parallel..... 33⅓&10%
Hammer & Co.:
Adjustable ..... 20&5%
Carriage Makers' H, P. Screw. 40&5%
Myers' Hay Rack..... 50%
Lineman's Swedish Neverturn..... 65%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain,

Iwan's Champion, Adjustable..... 50%
Iwan's Champion, Stationary..... 40%

Sidewalk—

American Fork & Hoe Co.:
Star, ℔ doz., Socket, $4.00; Shank $3.50
Shank, ℔ doz., X 7½, $3.50; Shank, X 8..... $3.75

Cleavers, Butchers'—

Foster Bros..... 30%
Fayette R. Plumb..... 30%
L. & I. J. White Co..... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each.. $10.75
20th Century Horse, each... $5.00
Lightning Belt Horse, each. $15.00
Chicago Belt Horse, each.. $20.00
Stewart's Enclosed Gear Ball Bearing Horse, each..... $7.50
Stewart's New Model Sheep Shearing Machine, each. $12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each.. $9.75
} 33⅓%

Clips, Axle—

Regular Styles, list July 1, '05, 80&80&10%

Cloth and Netting, wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs..... 70%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list..... 40%
Leather, Walter B. Stevens & Son's list 40%

Compasses, Dividers, &c.

Ordinary Goods..... 75@75&5%

Conductor Pipe,—

L. C. L. to Dealers:

Gal. Steel.	*Charcoal.*	*Copper.*
Northeastern:		
70&10@—%	50&10&7½%	50&10%
Eastern:		
75@—%	50&10&7½%	50&10%
Central:		
75@—%	60%	50&10%
Northwestern:		
75@—%	60%	50&10%
Western:		
70&10@—%	50&12½%	50&5%
Tennessee:		
70&10@—%	50&12½%	50&10%
Southern:		
70&10@—%	50&12½%	50&5%
Southwestern:		
70@—%	50&5%	50&5%

Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled..... 10%
Agate Lined..... 10%

Coppers' Tools—

See *Tools, Coopers'.*

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21½¢; lighter than 3 lb. to pair..... 23½¢

Cord— Sash—

Braided, Drab..... *lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 22¢; No. 7, 22½¢; No. 6, 23½¢. In lots of 12 doz. or over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18. 37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India..... *lb., 11@11½¢*
Cotton Sash Cord, Tw'ted. 18@20¢
Patent Russia..... *lb*.... 20¢
Cable Laid Russia..... *lb*.... 21¢
India Hemp, Br'd'd..... *lb*.... 21¢
India Hemp, Twisted.. *lb.* 13@14¢
Patent India, Twisted.. *lb*.... 17¢
Pearl Braided, cotton, No. 6, ℔ lb. 20½¢; No. 7, 19½¢; Nos. 8 to 12, 19½¢, in 12 doz. to 100 doz. lots.
Eddystone Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 7 to 10..... ℔ lb 23¢
Pullman:
Wire Sash Cord..... 10%
Sash Cord Attachments, per 100.. $2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord..... 50¢
Massachusetts, White... ℔ lb 40¢
Massachusetts, Drab... ℔ lb 45¢
Phoenix, White, Nos 8 to 12.... 27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen.... 57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length..... 90@—%
Short Length..... 90&20@—%
Hendryx Standard Wire Picture Cord, 90&10%
Turner & Stanton Co. Wire Picture Cord 90%

Cradles—

Grain 50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible.... $7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black..... $4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks..... $10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ¼ x 3-16, $2.50; 5 x 1¼ x 3-16..... $3.00
Suremark, Black, $2.25; Blue, Red and Yellow..... $2.50

Crooks, Shepperds'—

American Fork & Hoe Co.:
Montana ..... ℔ doz. $4.50

Crow Bars—See *Bars, Crow.*

Cultivators—

American Fork & Hoe Co.:
Victor Garden..... 50&10%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847. ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor..... ℔ doz. $3.00
Wm. Rogers & Son..... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co..... 40%
Red Devil..... 60%
B. Mfg. Co..... 40%
Woodward 50%

Meat and Food—

American 30%
Nos. 401 402 403 404 405 406 407
Each ... $5 $7 $10 $12 $25 $50 $60
Enterprise:
Nos..... 5 10 12 22 32
Each ..$2 $3 $2.75 $4.50 $6 25@25&7½%
No. 202, $1.50..... 40&7½%
P. S. & W. Co.:
Ideal ..... 40@40&5%
Hales ..... 60&5%
Little Giant..... ℔ doz. 40@50%
Nos.. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
New Triumph No. 605, ℔ doz. $24.00.. 40%

Russwin Food, No. 1, $24.00; No. 2, $27.00; 3, $42.00..... 15&10&10%
$15.00 $18.00
Enterprise Beef Shavers..... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters..... 35%
Corn Graters..... 30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ..... ℔ doz. $4.00

Tobacco—

All Iron, Cheap... doz, $4.25@4.50
Enterprise ..... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ..... 40%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00..... 25%
Samson, ℔ doz., $34.00..... 25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, ℔ doz., $7.00
Perfection Post Hole Diggers, ℔ doz. $8.50
Split Handle Post Hole Diggers, ℔ doz., $7.50
Hercules Pattern, ℔ doz..... $9.50
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer..... $7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dividers—See *Compasses.*

Drawing Knives—

See *Knives, Drawing.*

Dressers Emery Wheel—

Sterling Emery Wheel Dressers..... 35%
Sterling Wheel Dresser Cutters..... 35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines ..... $1.50@1.75
Breast, Millers Falls..... 15&10%
Breast, P., S. & W..... 33⅓%
C. & C. Ratchet..... 25%
Reversible Ratchet Die Stocks.... 25%
Goodell Automatic Drills. 50&10&10&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $8.16..... 40&10@50%
Millers Falls Automatic Drills, 33⅓&10%
Ratchet, Curtis & Curtis..... 25%
Ratchet, Parker's..... 40%
Ratchet, Weston's..... 40%
Ratchet, Weston's, Style H Improved ..... 40@40&5%
Ratchet, No. 012..... 40@40&5%
Ratchet, Celebrated..... 40@40&5%
Ratchet, Whitney's, P., S. & W.. 40&10@50%
Whitney's Adjustable, No. 10, $12.00.. 33⅓%

Twist Drills—

Bit Stock..... 70@70&10%
Taper and Straight Shank..... 65@65&10%

Drivers, Screw—

Screw D'ver Bits, per doz. 45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 ..... 50%
Buck Bros.' Screw Driver Bits..... 30%
Champion 50%
Disston's 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible ..... 55&7½%
Standard Neverturn..... 66⅔%
Star ..... 75&5%
Screw Driver Bits..... 25%
Fray's Hol. H'dle Sets, No. 3, $12.. 50%
Ford's Brace Screw Drivers.... 40&10%
Gay's Double Action Ratchet..... 35%
Goodell's Auto..... 65@65&10%
Mayhew's Black Handle..... 40%
Mayhew's Monarch..... 40%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540. 40&10%

Eave Trough, Galvanized—

Territory.	*Gal. Steel.*	*Copper.*
Northeastern..	75&10&5%	50&10%
Eastern.....	80%	50&10%
Central.....	80&10&5%	50&10%
Northwestern..	80&10&5%	50&10%
Western	80&5%	50&5%
Tennessee.....	80&5%	50&10%
Southern.....	75&10%	50&5%
Southwestern..	75&10&2½%	50&5%

Terms.—2% for cash. Factory shipments generally delivered.
Note.—Lower prices are quite general owing to market irregularities.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4..... 80%
Sizes 1½, 2½, 3½, 5, 6... 60&10%
No. 26..... 50%
No. 24..... 35%
Copper Elbows..... 30%

Elbows, Stove Pipe—

Edwards, Standard Blue.... 40&10&10%
Edwards, Royal Blue..... 40&10&10%
Reeves, Dover, Flat Crimp.. 40&10&5%

Emery, Turkish—

	¼ to ½:	½ to 220:	Flour.
Kegs ..... *lb.*	5 ¢	5¼¢	5¼¢
½ Kegs..... *lb.*	5¼¢	5¾¢	5¾¢
¼ Kegs..... *lb.*	5¼¢	6 ¢	

10-lb. cans, 10 in case....6½¢ 7 ¢ 8 ¢
10-lb. cans, less than 10.....10 ¢ 10 ¢ 8 ¢
Less quantity..10 ¢ 10 ¢ 8 ¢
NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—
Ford's Auger Bit Extensions....40&5%

Extractors, emon Juice—
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated.....50%
Walling's 50%
Upson's Patent.....40%

Cord and Weight—
Ives, ₩ gro., $1.08.....10%
Titan, ₩ gro., $0.66.....10%

Corrugated—
Acme Corrugated Fasteners.....70%

Faucets—
Cork Lined.....50&10@60%
Metallic Key, Leather Lined, ..60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key...60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
Self Measuring: Self Measuring and Enterprise, ₩ doz., $36.00.....40&10%
Pump, ₩ doz., $36.00.....40&10%
Lane's, ₩ doz., $36.00.....40&10%
National Measuring, ₩ doz, $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%
Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33⅓@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 86.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:				
Inch	.15	17	19	21
Per doz.	$3.60	3.85	4.15	4.65

Peck, Stow & Wilcox Co.:

In.	15	17	19	21	24	
	$4.00	4.40	4.75	5.50	6.50	30%

Reading Hardware Co.....60%

Fodder Squeezers—
See *Compressors.*

Forks—
American Fork & Hoe Co.:
Iowa Dig-Ezy Potato.....70&5%
Hay, Regular, 3-tine.....45&20&12½%
Hay, Regular, 4-tine.....60&7½&5%
Champion, Hay.....60&12½%
Acme, Hay.....60&20%
Manure, Regular, 4-tine.....65&5%
Manure, Regular, 5 and 6 tine....70%
Champion, Manure.....65&5%
Columbia, Manure.....70%
Acme, 4-tine.....60&10&5%
Round Shoulder Header, 4-tine..65%
Champion, Header.....65%
Dakota, Header.....65%
Kansas Header.....65%
Wood, Barley.....35&5%
Steel, Barley.....66%
Columbia, Spading.....70&7½&5%

Frames— Wood Saw—
White, S'g't Bar, per doz. 75@80¢
Red, S'g't Bar, per doz. $1.00@1.25
Red, Dbl. Brace, per doz. $1.40@1.80

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.25	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&5%

Gauges—
Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c..67½%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....65@65&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush, 35&10@50%
Elwell's 40%

Grease, Axle—
Common Grade...gro. $6.00@$6.50
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, ₩ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—
Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 .....30%
Alundum Sickle Grinders, each, Nos. 20, $5.00; 20A, $6.00; 20A Combined, $6.50.....30%
Alundum Disc Grinders, each, $2.50 .....30%

Grindstones—
Pike Mfg. Co.:
Improved Family Grindstones, ₩ inch, ₩ doz., $2.00.....33⅓%
Richards Mfg. Co., Eld and Cycle Ball Bearing, mounted.....40%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....70&10%
Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50&5@50&10&5%
Brown Tie Outs.....70&10@75&5%
Covert Mfg. Co.:
Web .....30&2%
Jute Rope.....35%
Sisal Rope.....20%
Cotton Rope.....45%
Hemp Rope.....40%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....45&5@50&10&5%

Hammers—
Handled Hammers—
Heller's Machinists'....55&10@55&10&5%
Heller's Farriers.....40&5@40&10&5%
Peck, Stow & Wilcox Co.:
Crucible Steel.....40&10@50%
Farriers' .....40&10@50%
Riveting .....40&10@50%
Machinists' .....66⅔&5%
Blacksmiths' 50%
Elmore Shoemakers' Hammers.....75%
Fayette R. Plumb:
A. E. Nail.....40&2½@40&12½%
Eng. and B. S. Hand.50&10&5@60&5%
Machinists' Hammers.....60&10&5%
Rivet and Tinners'.40&7½@40&12½&5%
Victor Magnetic Tack, ₩ gro....$7.75

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢...80&10&10%
Over 5 lb., per lb., 30¢.....
Over 5 lb., per lb., 30¢.80&10&10%

Handles—
Agricultural Tool Handles
Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....40%
Fork, Shovel, Spade, &c.:
Long Handles.....40%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $3.00@$3.50
Brad Awl.....gro. $1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.80@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished, doz., 80¢ 85¢; Not Varnished.....65@75¢
Plane Handles:
Jack, doz., 30¢; Fore, doz...45¢
Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel .....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ₩ gro. $0.85@$1.80
J. L. Osgood:
Indestructible File and Tool, ₩ gro., No. 1, $8.00; No. 2, $6.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₩ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₩ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₩ doz., 28 to 34 in., $5.60; 36 in., $5.85.
Adze, ₩ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₩ doz., R. R., 36 in., $3.00; coal, 34 in., $5.80.
Hatchet, ₩ doz., 12 to 14 in., $2.00.
30%

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy. No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged .....net $6.00
Covered .....60&5%
Special .....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland .....70&7½%
Clipper, No. 75.....60%
Crown .....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₩ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction 60%
Hinged Hangers, King Charm.60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&5%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 29.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B, Swivel No. 135 .....40%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing, ₩ doz., 4 in., $12.00; 5 in., $14.00..40&10%
Myers' Stayon Hangers.....60%
Extra 5&10% often given.

Hangers— Garment—
Pullman Trouser, ₩ gro., No. 1 $9.00; No. 4, $24.00; No. 5, $16.80; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....₩ gro. $9.60

Gate—
Myers' Patent Gate Hangers, ₩ doz. net 50%

Joist and Timber—
Lane Bros. Co.,.....35%

Hasps—
Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₩ doz..60%

Hatchets—
Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—
Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 7D, $2.25; No. 3E, $2.50; No. 1, $3.00.....25%
Clark Coal, ₩ doz., $0.75.....20%

Hinges—
Blind and Shutter Hinges
Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.70; No. 3, $1.25; No. 5, $2.65.
Mortise Shutter.....80%
Mortise Reversible Shutter..80%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinge 20%
Hale's ...ind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₩ doz. sets, without screws, $0.95; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&5%
Niagara, Gravity Locking, Nos. 1 3 & 5.....75&5%
Clark's O. P., No. 1.....75&10%
Clark's O. P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer .....75&10%
Empire 65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L'f'chs.	$2.00	2.70	5.00
Hinges only.....	1.25	1.90	2.50
Latches only.....	.70	.75	.35

New England:
With Latch.....doz..@$2.00
Without Latch.....doz..@$1.60
Reversible Self-Closing:
With Latch.....doz..@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15
Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—
Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₩ doz. prs.....$1.00

Pivot Hinges—
Bommer Bros. Pivot, Ball Bearing 40%
Lawson Mfg. Co. Matchless.....30%

Spring Hinges—
Holdback, Cast Iron...$6.75@$7.00
Non-Holdback, C'st Iron$6.50@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing 40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 900.....₩ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor.50%
Garden City Engine House...25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ₩ gr., No. 14, $9.00; No. 18.....$25.00
Columbia, Adj., No. 7, ₩ gr.$12.00
Gem, new list.....30%
Clover Leaf and Acorn, per gro.....$12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Columbian Steel.....65&10%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30%
Matchless Jamb Hinges.....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₩ gr. $9.00
Chief Ball Bearings Floor Hinge 50%
Ball Bearing Door.....25%
No. 777, Sheet Steel Holdb'k, ₩ gr, pr.....$9.00
Standard Mfg. Co.:
Champion Double Acting Door Hinge .....25&10&10%
Standard Double Acting Floor Hinge .....25&10&10%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list February 10, 1908:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%
Screw Hook and Strap. 6 to 12 in..lb. 3½¢; 14 to 20 in..lb. 3¼¢; 22 to 36 in..lb. 3 ¢
Screw Hook and Eye:
⅜ to 1 inch.....lb. 6¼¢
⅝-inch .....lb. 7½¢
½-inch .....lb. 8½¢
Extra 10&7½&2½%

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
M'f'gr's list, price per gross:

Inch	15	16	17	18
Galv. Open	$35	$39	$42	$46
Jap. Open	26	28	31	35
Galv. Funnel	43	48	52	56
Jap. Funnel	33	36	39	43

10&7½&5%

Masons' Etc.
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—

Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%
Am. Fork & Hoe Co. (Scovil Pattern).....60&5%

Handled—

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50
American Fork & Hoe Co.:
Regular, Cotton.....75&10&5&2½%
Crescent, Cultivator.....75&2½%
Mattock, Senior.....70%
Mattock, Junior.....70%
Sprouting.....50%
Tobacco, Harper's.....66⅔&15&10%
Warren.....55&10&10&5
Ivanhoe.....65&15&10%
Cultivator, B B 6.....70&10&10&5%
Cultivator, B B 6½.....70&10&10&5%
Weeding, Acme.....72½&10&2½%
Scuffle, Lightning.....60&5%

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $21.00.....45&10%

Door—

Bardsley's, Iron, 40%; Brass and Bronze.....25%
Empire.....50%
Pullman.....25%
Richards Mfg. Co.: No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%
Superior.....40%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ₱ gross, $18.00; ₱ doz.....$2.00

Trace and Rein—

Fernald Double Trace Holder, ₱ doz. pairs.....$1.25
Dash Rein Holder, ₱ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45&20%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....40%

Wire—

Belt, Nos. 1 to 15....75&10@80%
Wire C. & H. Hooks..80@80&10%
Bradley Metal Clasp Wire, Coat and Hat, 75&10@80%; Ceiling..75&10@80%
Columbian Hdw. Co., Gem.....75&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 70&10%; Crown, 75%; Czar, 65&10%; Brace, 75%; Czar Harness, 50%; Ceiling, 75%.

Wrought Iron—

Box, 6 in., per doz., $0.90; 8 in., $1.15.
Cotton.....doz. $1.25@$1.50
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, per doz., $2.75@$3.00
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Turner & Stanton Co. Cup and Shoulder.....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 6@6½¢
3-ply Guaranteed....ft. 8½@9¢
4-ply Guaranteed....ft. 9½@12¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@ 9¢
Fair Quality.....ft. 10@11¢

Irons— Sad—

From 4 to 10.....lb. 2½@2¾¢
B. B. Sad Irons.....lb. 3¼@3½¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Caps	*86*	*93*	*96*	*93*
Tin'd Caps	*91*	*88*	*1.01*	*96*

New England Pressing..lb. 3¾@4¢

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner.....60%

Pinking—

Pinking Irons.....doz. 60@65¢

Irons, Soldering

See *Coppers.*

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Ladder—

Richards Mfg. Co., Ladder Jacks..52%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..40%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co....60%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%
American Fork & Hoe Co.:
Easy Cut, ₱ doz. No. 10 C H...$2.10
Easy Cut, ₱ doz., No. 10 B C H. $2.20
Acme, ₱ doz.....$2.35
Dent, ₱ doz.....$2.35
Adjustable, Serrated, ₱ doz.....$1.90
Serrated, ₱ doz.....$1.85
Yankee, No. 1 C H.....$1.35
Yankee, No. 2 C H.....$1.15

Drawing—

Standard List.....80&10@—%
C. E. Jennings & Co., Nos. 45, 46. 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's.....66⅔@70%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Miscellaneous—

Farriers'.....doz. $2.60@3.55
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Carriage, Jap., Drive, all sizes, gro. 35@40¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Belting, Leather*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co., Melting and Plumbers'.....25%
P., S. & W.....40&10%
Reading.....60%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular—

Regular, No. 0.....doz. $3.50@4.00
Side Lift, No. 0.....doz. $4.00@4.50
Hinge Globe, No. 0. doz. $4.00@4.50
Other Styles.....40@40&10%

Bull's Eye Police—

3-inch.....$3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws.....doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$4.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps—*

Lifters, Transom—

R. & E.....10%

Lines—

	Wire Clothes, Nos.	*18*	*19*	*20*
100 feet		*$2.30*	*1.95*	*1.75*
75 feet		*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton....20%
Shade Cord, Cotton or Linen....20%

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Crescent.....10%
Automatic Gravity Metal Sash, ₱ gro., $189.58.....10%
Window Ventilating.....10%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks.....40%
Taylor Mfg. Co., Perfect Ventilating, ₱ doz.....$0.75@$1.00

Machines—Boring—

Com. Upr't, without Augers, $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—

Reisinger Invincible Hand Power... ₱ doz. $48.00

Fence—

Williams' Fence Machines....each. $5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Cyclone High Speed Chain Hoist.....25%

Ice Cutting—

Chandler's.....12½%

Washing

Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$57.00
Champion Rotary Banner No. 1.$57.00
Standard Champion No. 1.....$50.00
Standard Perfection.....$27.00
Cincinnati Square Western.....$33.00
Uneeda American, Round.....$33.60

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee.....20@25%
Shell and Corn.....25&10%
National list Jan. 1, 1902.....30%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Divine's Red Devil.....30%

$2.50	3.50	10.00	15.00	.....33⅓%
No. 1.	2	3	4	

Lippincott's:

No.....	1	2	3	4	
	$2.50	3.50	10.00	15.00	..33⅓%

Pike Mfg. Co., Tool and Knife Grinding.....33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $2.00; advance 10¢ for each size.
Cheap, 10-in., $2.25; advance 15@20¢ for each size.
Better Grade, 10-in., $3.00; advance 25¢ for each size.

	12	*14*	*16*	*18-in.*
High Grade...	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60%
Pennsylvania, Jr., Ball Bearing, 50&10&5%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%

Nails—

Wire Nails and Brads, Miscellaneous.....85&5@85&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor.....	23	21	20	19	18	.. ₱ lb. net, 12¢
Coleman....	13	12	12	11	11	net ₱ lb
New Haven..	23	21	20	19	18	.. ₱ lb. net, 12¢
Livingston..	19	18	17	16	16	.....10%

Western.....₱ lb 8¼¢
Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	2	2½	3 in.
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro.	*1.10*	*1.10*	*1.10*	

Upholsters—

Brass.....30%
Plated.....30&10%

Nippers—

See *Pliers and Nippers.*

Nipples—

Standard Nipple Co.:
Wrought Pipe Nipples.....80%

Nuts— *Blank or Tapped.*

Cold Punched: Off list.
Square.....5.10¢
Hexagon.....6.00¢
Square, C., T. & R.....5.80¢
Hexagon, C., T. & R.....6.60¢
Hot Pressed: Off list.
Square.....5.90¢
Hexagon.....6.40¢

Oakum—

Best.....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy.....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....50&10%
Zinc.....65&10@10%
Railroad.....60&10&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Packing Box—

Herculever, ₱ doz., $24.....30%

Can Openers—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle.....40¢
Sardine Scissors.....$1.75@3.00
Can and Bottle Openers, ₱ doz., net: Yankee, $0.75@$0.85; Little Gem, $0.50@$0.65; Nifty.....$0.75

Egg—

Hartigan Nickel Plate, ₱ doz., $2.00; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....16@17¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₱ lb, 80¢.....25%

Miscellaneous—

American Packing....lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute.....lb. 4@4½¢
Russia Packing.....lb. 9@10¢

Pails, Water, Well, &c.—

See *Buckets.*

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List.....75%
Edwards, Royal Blue.....75%

Fry—

Common Lipped:

Nos.....	*1*	*2*	*3*	*4*	*5*
Per doz....	*$0.75*	*0.85*	*0.95*	*1.15*	*1.30*

Refrigerator, Galva.—

Inch.....	*12*	*14*	*16*	*18*
Per doz....	*$1.75*	*2.25*	*2.80*	*3.15*

Paper—Building Paper

Asbestos: lb.
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft..2¼¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....3½¢
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....3½¢
Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll, 48@58¢
Medium weight, 30 lbs. to roll. 56@70¢
Heavy weight, 40 lbs. to roll, 75@78¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 2, 6 and 4½ sq. ft. to lb., ton.....$54.50
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton. $34.00@$38.00
2 ply, roll 108 sq. ft.....65¢
3 ply, roll 108 sq. ft.....88¢
Slater's Felt (roll 500 sq. ft.).80¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—

Goodell Co.:
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
New Lightning.....₱ doz. $7.00
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00
Bonanza Improved.....each $7.50
Dandy.....each $10.00
Eureka Improved.....each $20.00
New Century.....each $20.00
Ranger.....each $30.00

Livingston Nail Co.:
Daisy ..... ℔ doz. $4.00
Little Star ..... ℔ doz. $5.00
Rocking Table ..... ℔ doz. $6.20
Reading Hardware Co.:
Advance ..... ℔ doz. $4.00
Baldwin ..... ℔ doz. $4.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25

Orange—
Goodell Co., Success ..... each $20.00

Potato—
Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—
(List Jan., 1908.)
List ..... 75&10%
Cronk's Handled Garden Mattock, ℔ doz., $3.00 ..... 33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass ..... 50@50&10%
Iron, list Nov. 11, '85 ..... 60@60&10%

Pipe, Cast Iron Soil—
Eastern Prices:
Standard, 2-6 in ..... 68½% } *Extra, 10 &10&5%*
Extra Heavy, 2-6 in. ..... 74½% } *Extra, 10 &10&5%*
Fittings, Standard and Heavy ..... 81¼% } *Extra, 10 &10&5%*

Pipe, Merchant—
Carloads to Consumers:

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in..	} See Trade Report			
⅜ in.....				
½ in.....				
¾ to 6 in....				
7 to 12 in....				

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class 87½
Second-class 90%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Edwards' Nested:		
5 in., Standard Blue	$6.25	$7.25
6 in., Standard Blue	6.75	7.75
7 in., Standard Blue	7.75	8.75
5 in., Royal Blue	7.00	8.00
6 in., Royal Blue	7.50	8.50
7 in., Royal Blue	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color	$5.90	$6.90
6 in., Uniform Color	6.40	7.40
7 in., Uniform Color	7.40	8.40

Planes and Plane Irons—
Wood Planes—
Bench, first qual ..... 30@30&5%
Bench, second qual ..... 40@40&5%
Molding ..... 25@25&5%
Chapin-Stephens Co.:
Bench, First Quality 30%
Bench, Second Quality 40%
Molding and Miscellaneous 25%
Toy and German 30%
Union 60%

Iron Planes—
Chaplin's Iron Planes 60%
Union 60%

Plane Irons—
Wood Bench Plane Irons, list Dec. 12, '06 ..... 35%
Buck Bros. 30%
Chapin-Stephens Co. 25%
Union 50%
L. & I. J. White ..... 30&5@25%

Planters, Corn, Hand—
Kohler's Eclipse ..... ℔ doz. $7.50

Plates—
Felloe ..... lb. 3¾@4¢
Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ⅝-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—
Never-Break ..... 75&10%

Pliers and Nippers—
Button Pliers ..... 75&5@75&10&5%
Gas Burners, per doz., 5 in., $1.25 @1.30; 6 in., $1.45, $1.50.
Gas pipe.. 7 $2.00 | 8 $2.25 | 10 $2.75 | 12-in. $3.50
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button 60%
Improved Button ..... 75&10%
Cronk's 60%
No. 80 Linemen's 50%
Stub's Pattern 45%
Combination and others 33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers 70%
Wire and Cutting Pliers 75%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&5@40&10&5%
P., S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10%
Chapin's Imp. Brass Cor. ..... 40@40&10%
Pocket Levels ..... 30@30&10%
Extension Slide ..... 30@30&10%
Machinists' Levels ..... 40@40&10%
Disston's Plumbs and Levels ..... 60&10%
Disston's Pocket Levels ..... 60&10%
Stanley's Dulex 35%
Woods' Extension 33⅓%

Points, Glaziers'—
Bulk and 1-lb papers ..... lb. 9 ¢
½-lb. papers ..... lb. 9½¢
¼-lb. papers ..... lb. 10 ¢

Police Goods—
Manufacturers' Lists ..... 25@25&5%
Tower's 25%

Polish—Metal, Etc—
Ladd Co.:
Putzade Liquid, ℔ gro., ⅛ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ℔ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.00.. 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, ⅝ oz. cans, ℔ doz., $1.25.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can ..... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50

Window Polish—
Benj. P. Forbes:
Glasbright, No. 2, gal pails, ℔ doz., $24.00; each, $2.50; 1 lb cans, each ..... 75¢
Glasbright Powder, bbls., ℔ lb.. 20¢

Poppers, Corn—
1 qt. Square..doz. $0.80; gro. $8.75
1 qt. Round..doz. $0.90; gro. $10.00
1½ qt. Square. doz. $1.20; gro. $12.00
2 qt. Square..doz. $1.50; gro. $15.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 6 ft., 46¢; 6½ ft., 48¢; 7 ft., 50¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled 40%
Tinned ..... 30&10%

Powder—
Black Sporting:
Kegs (25 lb.)..$5.00@5.50 } *Discount to the trade, 10%.*
Half Kegs (12½ lb.), $2.75@3.00 } *Discount to the trade, 10%.*
Quarter Kegs (6¼ lb.), $1.50@1.65 } *Discount to the trade, 10%.*
Canisters, pounds... .25 } *Discount to the trade, 10%.*
Canisters, ½ pounds. .15 } *Discount to the trade, 10%.*
Canisters, ¼ pounds. .12 } *Discount to the trade, 10%.*
NOTE.—Prices vary according to territory.
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Presses—
Fruit, Wine and Jelly—
Enterprise Mfg. Co. ..... 20@25%

Seal Presses—
Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Nail, Etc.—
Cyclops 50%
Elmore Tool Mfg. Co.:
Drop Forged Tack Pullers 10%
Nail Pullers 40%
Miller's Falls, No. 3, ℔ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
The Scranton Co. Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B 70%
Giant 50%
Staple Pullers, Utica and Davison 60%
Taylor Mfg. Co., Sampson Tack, ℔ doz. $0.40

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., ½ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz	$0.16	.19	.25	.30
Inch	1¾	2	2¼	2½
Side, doz	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—
Common Frame; Square or Round End, per doz., 1¾ and 2 in ..... 17@20¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in ..... 20@21¢
Acme, No. 35..1⅜ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle ..... 50&10%
Wrought Steel, Eagle, ℔ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in. ..... 27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ℔ doz. ..... 19¢
Common Sense ..... ℔ doz. 20¢
Merit, ℔ doz., 2¼ in. ..... 37¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless.. 50%
Niagara, No. 25, 1⅜ in., 19¢; 2 in. ..... 20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—see Blocks.

Pumps—
Cistern 60%
Pitcher Spout ..... 75&10&5@80
Wood Pumps, Tubing, &c 50%
Barnes Dbl. Acting (low list) 50%
Barnes Pitcher Spout 80%
Contractors' Rubber Diaphragm, No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.50
Flint & Walling's Fast Mail Hand (low list) ..... 50&5%
Flint & Walling's Fast Mail (low list) ..... 50&5%
Flint & Walling's Tight Top Pitcher 80%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50 ..... 30%
Myers' Pumps (low list) ..... } 50%
Myers' Power Pumps ..... } 50%
Myers' Spray Pumps ..... } 50%

Pump Leathers—
Plunger and Valve Leathers—Per gro.:

No.	1	2	3	4
	$5.00	6.00	7.00	8.00

Cup Leathers—Per 100:

Inch	2½	3	3½	4
	$5.00	7.00	9.00	12.00

30@30&5%

Punches—
Saddlers' or Drive, good, doz. ..... 50@75¢
Spring, single tube, good quality $1.75
Revolving (4 tubes)....doz. $3.50
Bemis & Call Co.'s Cast St'l Drive. 50%
Elmore Tool Mfg. Co.:
Machinists' Center 40%
Tinners': Solid, 50%; Prick 50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Tinners' Hollow, P., S. & W. Co.. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 40&10%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 50%
Cronk's:
Double Braced Steel Rail.. ℔ ft. 2¾¢
O. N. T. Rail ..... 2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ℔ 100 ft. $3.45
O. N. T., ℔ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ℔ 100 ft., $7.50; 1¼ x 3-16 in., $8.75 ..... 55&7½%
Trolley, No. 301, ℔ ft. ..... 9¢
McKinney's:
Hinged Hanger Track, ℔ ft., 11¢ ..... 60&5%
1 x 3-16 Track ..... 55&7½%
Myers' Stayon Track ..... 60&5%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail.. 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50 ..... 60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—
NOTE.—Many goods are sold at net prices.
American Fork & Hoe Co.:
Lawn, ℔ doz., No. 24, $2.50; No. 29 ..... $2.25
Cronk's:
Steel Garden: Champion, ℔ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal, ℔ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ℔ doz., 20 teeth, $2.85; 24, $3.00 ..... net
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Ideal Steel Garden, ℔ doz., 12 teeth, $15.00; 14, $16.00; 16, $18.00 ..... 80%
Kohler's:
Jumbo Lawn, 36-tooth.... ℔ doz. $5.00
Lawn Queen, 20-tooth.... ℔ doz. $2.85
Lawn Queen, 24-tooth.... ℔ doz. $3.00
Paragon, 20-tooth ..... ℔ doz. $2.65
Paragon, 24-tooth ..... ℔ doz. $2.75
Steel Garden, 14-tooth.... ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00

Rasps, Horse—
Disston's 75%
Heller Bros. ..... 70&5@70&10&5%
Liveright Bros.' Gold Medal. 70&10@75%
McCaffrey's American Standard ..... 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—
John Engstrom Swedish 65%
Sharp Shaver 60%
Fox Razors, ℔ doz., No. 42, $24.00; No. 44, $20.00; No. 82, Platina, $36.00. } Discount 60%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2304 P, 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 92084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%; 986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN. 33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal. 40%

Revolvers—
Single Action ..... $5¢@$1.00
Double Action, except 44 cal. $2.00
Double Action, 44 caliber... $2.00
Automatic $4.00
Hammerless $4.50

Riddles, Hardware Grade
16 in.....per doz. $2.50@$2.75
17 in.....per doz. $2.75@$3.00
18 in.....per doz. $3.00@$3.25

Rings and Ringers—
Bull Rings—

	2 inch.	2½ inch.	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.10	1.25	1.65 doz.

Hog Rings and Ringers—
Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes, 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz. 85@95¢
Blair's Rings..per gro. $5.50@$6.00
Blair's Ringers..per doz. 65@70¢

Rivets—
Copper Rivets and Burrs....50%
Tinners' and Miscellaneous Rivets ..... 80@80&10%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 50 count, —; Tin boxes, 100 count, —.
Tubular, per doz. boxes, 50 count, —; 100 count, —.

Rollers—
Cronk's Stay, No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60 ..... $0.75
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53. 75¢
O. K. Adj. and Reversible No. 58. 50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 51 ..... 60%

Rope—
Manila, 7-16 in. diam. and larger: Pure ..... lb. 8¼@8½¢
Sisal, 7-16 in. diam. and larger: Pure ..... lb. 6¾@7¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure ..... lb. 7¼@7½¢
Sisal, Tarred, Medium Lath Yarn: Pure ..... lb. 6¼@6½¢
Cotton Rope: Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15@16¢
Common, ¼-in. and larger..7½¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. and up, lb. ..... 6½¢
Thread, No. 2, ¼-in. and up, lb. ..... 5¢

Wire Rope—
Galvanized ..... 47½&2½%
Plain ..... 55&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute, 35%; Sisal 20%

Rules
Boxwood ..... 60&5%
Ivory ..... 25&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Union Nut Co.:
Boxwood ..... 60@65&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 45%
Band ..... 50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%
Chapin-Stephens Co.:
Turning Saws and Frames 30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws ..... 30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 50%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 30%
C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%
Peace & Richardson's Hand Saws 30%
Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 45%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. ..... 25@25&7½%
Wood Saws ..... 40&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 25%
Disston's:
Concave Blades 25%
Keystone Blades 35%
Hack Saw Frames 30%
Simonds, 25%; The Best, 35%; Culley 35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Whitaker Mfg. Co.:
National Hand Blades, Hand Frames, Power Blades 40%

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain ..... $2.10@2.20
Union Platform, Stpd ..... $2.20@2.50
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
The Standard Portables 40%
The Standard R. R. and Wag-

Scrapers—

Box, 1 Handle ..... doz. $1.85@2.10
Box, 2 Handle ..... doz. $2.35@2.50
Ship ... Light, $2.00; Heavy, $4.50
Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¾, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 80&10%
Coach, Gimlet Point ..... 80&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%
Swett Iron Works ..... 70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.
Flat Head, Iron ..... 87½&5@ .. %
Round Head, Iron ..... 85&5@ .. %
Flat Head, Brass ..... 80&5@ .. %
Round Head, Brass ..... 77½&5@ .. %
Flat Head, Bronze ..... 75&5@ .. %
Round Head, Bronze ..... 72½&5@ .. %
Drive Screws ..... 87½&5@ .. %

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Plain Grass, Cutting Edge Polished ..... $6.25@8.50
Clipper, Bronzed Web ..... $6.50@8.75
Solid Steel, Web and Backs Polished ..... $7.00@7.25
Bush, Weed and Bramble, Painted ..... $6.50@6.75
Grain, Painted, Cutting Edge Polished ..... $8.25@8.50
Clipper Grain, Bronze Web, $8.50@8.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Garden Tool Sets—

American Fork & Hoe Co.:
Rake, Shovel and Hoe, ₱ doz. sets, No. 3 P F $7.25

Sets, Nail—

Octagon ..... gro. $3.50@3.75
Buck Bros. 27½%
Elmore Tool Mfg. Co. 30%
Mayhew's ..... ₱ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt. ..... ₱ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Giant Royal Cross Cut ..... ₱ doz. $7.50
Royal, Hand ..... ₱ doz. $4.50
Taintor Positive ..... ₱ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ₱ doz., net, $24.00
Smith & Hemenway Co.'s 75%

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz. $1.50
Mounted Kitchen Sand Stone, ₱ doz. $1.50
Natural Grit Carving Knife Hones, ₱ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz. $1.50
Quick Edge Pocket Knife Hones, ₱ doz. $2.50

Skate—

Smith & Hemenway Co., Eureka 50%

Shaves, Spoke—

Iron ..... doz. $1.25
Wood ..... doz. $2.00
Bailey's (Stanley R. & L. Co.) 45%
Chapin-Stephens Co. ..... 30@30&10%
Goodell's, ₱ doz. $9.00 ..... 15&10%

Shears—

Cast Iron..	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Checp	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel ..... 60&10&5%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40&10&5%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, 60&10&5%
Full Nickel ..... 50&10&5%
Heinisch's Tailor's Shears 10%
National Cutlery Co.'s Nickel Plated, 60&10%; Japan Handles ..... 70&10%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%
Acme Cast Snips ..... 40@45&5%
W. H. Compton Shear Co., Forged Steel Handles 35%
Forged Handles, Steel Blades, Berlin 50%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s 6¼ to 10 in. ..... 33⅓&7½%
National Cutlery Co.'s Forged Steel 50%
Niagara Snips 40%
P. S. & W. Forged Handles, 25%:
W. R. W. 50%
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

W. H. Compton Shear Co., Dropped Forged Steel 35%
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00 ..... 25%
Disston's Pruning Hook only, ₱ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P. S. & W. Co. ..... 40&10%
Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, 60&10%

Sheaves—Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 15%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, 60&5%

Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, 25&10%
Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade ..... 25&5%
Union, League, 10 and 12 gauge, Rival Grade 25%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Challenge, Monarch, 10, 12, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders 40&5%
Arrow, Smokeless Powders 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Edwards Mfg. Co.:	Painted.	Galv.
14 x 20	$4.25	$6.00
10 x 14	4.50	6.25
7 x 10	4.75	6.50

Wheeling Corrugating Co.:
Dixie, 14 x 20 in. ..... $4.05 ..... $5.05
Dixie, 10 x 14 in. ..... 4.25 ..... 5.45
Dixie, 7 x 10 in. ..... 5.25 ..... 6.70

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg. $4.10
Steel ..... per keg. $3.85
Burden's, all sizes ..... ₱ keg $3.90

Shot—

	25-lb. bag.
Drop, up to B	*$1.70*
Drop, B and larger	*1.95*
Buck	*1.95*
Chilled	*1.95*
Dust	*2.30*

Shovels and Spades—

Association List ..... 40&7½&40&10%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $2.50@$2.75
Wood and Mail, D Handle, $2.65@$2.90

Sieves and Sifters—

Hunter's Imitation, gro $9.50
Hunter's Genuine, per gro $12.00

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each, $3.25; ₱ doz. $39.00

Sieves, Seamless Metallic
—Per dozen.—

Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... doz. $0.90@0.95
Mesh 20, Nested ..... doz. $1.00@1.05
Mesh 24, Nested ..... doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 24 to 24 x 50 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list 60%

NOTE—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 70@70&10%
Steel ..... 35@40%

Slates, School—
Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..
60&7 tens.
Victor A, Noiseless ..... 60&4 tens 45%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%
High Grade, 40%; Trojan 40%
Jockey 25%

Snaths—

Grass Scythe ..... 50@50&5%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... per gro. 50@55¢
Tables ..... per gro. $0.90@$1.00
Atlas Mfg. Co.:
Tea Spoons, ₱ gro. ..... 50¢@55¢
Table Spoons, ₱ gro. ..... $0.90@$1.00

Springs— Door—

Bardsley's Spring and Check 40%
Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman Door and Gate 10%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 30 in. ..... ₱ doz. $1.00

Carriage, Wagon, &c.—

1¼ in. and Wider:	*Per 100 lb.*
Black	*$4.75@$5.00*
Half Bright	*$4.75@$5.00*
Bright	*$5.25@$5.50*

Painted Seat Springs:
1½ x 2 x 26 ..... per pair. 45@47¢
1½ x 3 x 28 ..... per pair. 68@71¢

Sprinklers, Lawn—

American Foundry & Mfg. Co.:
Cactus, 65%; Japanese, 70%; National, ₱ doz. $12.00
Enterprise ..... 25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated .. } *List Jan. 5, 1900.*
Steel and Iron .. } *80@—%*
Rosewood Hdl. Try Square and T-Bevels ..... 40&10&10&10%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 60 & 10%; Iron Stock and Bevel 15%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade ..... doz. $1.25
Tinned Iron ..... doz. $0.75@1.00
Iron, Porcelain Lined ... doz. $1.75
Victor, ₱ gro. $9.00

Staples—

Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $2.05; Galvanized $2.35
Poultry Netting Staples ..... per lb. 3¼@3½¢

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%

Steelyards— ... 50@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock 25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plate 25%

Stoners, Cherry—

Enterprise ..... 25@30%

Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies 40%

Stones, Oil, &c.—

Pike Mfg. Co., 1907 list: ₱ lb
Arkansas St., No. 1, 3 to 5½ in. $2.80
Arkansas St., No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 ..... $1.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 25¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
Washita Slips, No. 2 ..... 40¢
India Oil Stones (emtire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 40%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks 40%
Hindostan No. 1, R'g'lar. ₱ lb 8¢
Hindostan No. 1, Small.. ₱ lb 10¢
Turkey Oil Stones, Extra, 5 to 8 in. ..... ₱ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips ..... 40¢
Sand Stone ..... 6¢

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.50
Green Mountain S. S. ℔ gro. $7.00
Extra Indian Pond S. S. ℔ gro. $8.00
No. 1 Indian Pond S. S. ℔ gro. $7.50
No. 2 Indian Pond S. S. ℔ gro. $5.00
Leader Red End S. S. ℔ gro. $5.00
Quick Cut Emery ℔ gro. $10.00
Pure Corundum ℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat. $11.00
Emery Scythe Rifles, 4 Coat. $13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ℔ gro., $12.00. 33⅓%
$12.00 33⅓%
Lightning (Artificial), ℔ gro., $18.00 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 50@50&10%

Plane—

Chapin-Stevens Co. 20%

Straps— Box—

Acme Embossed, case lots. 20&10&10%
Cary's Universal, case lots. 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points . . doz. 55¢
All Steel Socket . . . doz. $2.00@2.25
Excelsior Stretcher and Tack Hammer Combined, ℔ doz., $6.00. . . . 20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%
P., S. & W. Co. 40&10&5%

Sweepers, Carpet—

Goshen Sweeper Co.:	Per doz.
Gilt Edge	$27.00
Superfine	26.00
Majestic	24.00
Select, Nickeled	22.00
National Sweeper Co.:	
National Queen, Nickeled	$27.00
Martha Washington, Nickeled	25.00
Monarch, Japanned	20.00
Perpetual, Japanned	18.00
Streator Metal Stamping Co.:	
Model E. Sanitaire	$25.00
Eureka	15.00
Streator Majestic, Nickeled	24.00
Streator Conqueror, Japanned	22.00

NOTE.—Leading Manufacturers give the following rebates from list prices: 50c per dozen on three-dozen lots: $1 per dozen on five-dozen lots; $3 per dozen on ten-dozen lots.

Tacks, Finishing Nails, &c.

American Carpet Tacks. 90&25@—%
American Cut Tacks . . 90&25@—%
Swedes' Cut Tacks. L. . 90&30@—%
Swedes' Upholsterers' . 90&35@—%
Gimp Tacks . . . . . 90&35@—%
Lace Tacks . . . . . 90&35@—%
Trimmers' Tacks . . . . . 90&30@—%
Looking Glass Tacks . . . . . 65@—%
Bill Posters' and Railroad Tacks, 90&10@—%
Hungarian Nails . . . . . 80@—%
Finishing Nails . . . . . 70@—%
Trunk and Clout Nails. 75&5@—%

NOTE.—The above prices are for Straight Weights.

Miscellaneous—

Double Pointed Tacks, 90&6 tens@—%
See also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.:

Gal.	Gasoline	Oil
50	$2.75	$3.00
60	$3.50	$4.00
110	$5.00	$5.75

Tapes, Measuring—

American Asses' Skin . . . . 50@—%
Patent Leather . . . . . 25@30&5%
Steel . . . . . 33⅓&5%
Chesterman's . . . . . 25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin . . . . . 40&10@50%
Favorite, Duck and Leather . . . . . 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkins:
Asses' Skin . . . . . 40&10@50%
Metallic . . . . . 30@30&5%
Patent Bend, Leather . . . 25&5@25&10%
Pocket . . . . . 40@40&5%
Steel . . . . . 33⅓&@33%
Wiebusch & Hilger:
Chesterman's Metallic, No. MI, etc. 25%
Chesterman's Steel, No. 1058L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lb. . . . . $2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c. . . . . 30@35%

Ties, Bale—Steel Wire—

Single Loop . . . . . 82½&10%
Monitor, Cross Head, &c. 70&2½%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White. . . . . 20@20&5%

Haying—

Myers' Hay Tools. 50%

Ice Tools—

Gifford-Wood Co. 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, ℔ doz., Nickel Plated, $1.50; Gold Plated. $2.00

Saw—

Atkins' Cross Cut Saw Tools. . . . 35&5%
Simond's Improved. 33⅓%
Simonds' Crescent. 30%

Ship—

L. & I. J. White. 25%

Torches—

Hammers, Engine, ℔ doz. $4.50

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro. . . . . $11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida . . . . . 75@10%
Newhouse . . . . . 50&5%
Hawley & Norton. . . . . 65&10%
Victor . . . . . 75@75&10%
Oneida Community Jump. . . . . 70&5%
Stop Thief. 60%
Tree Trap. 60%
Hector . . . . . 75@75&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine), ℔ doz.:

	Crate lots.	Small lots.
No. 1, Rat	$11.50	$14.50
No. 3, Rat	$5.75	$6.50
No. 3½, Rat	$4.70	$5.25
No. 5, Mouse	$2.25	$3.00

Animal Trap Co.:
Out o' Sight, Mouse, ℔ doz. $0.60
Out o' Sight, Rat, ℔ doz. 1.20
Easy Set, Mouse, ℔ doz. 35
Easy Set, Rat, ℔ doz. 85
Out o' Sight Chockers, ℔ doz. holes 12
Out o' Sight, Tin, 5-hole, ℔ doz. traps 75

Trowels—

Disston Brick and Pointing. 25%
Disston Plastering. 20%
Disston "Standard Brand" and Garden Trowels. 30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in bulk, net ℔ gro. $5.50
In 1 doz. boxes. . . . . ℔ gro. $6.00
Woodrough & McFarlin, Plastering. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern. . . . . 50&10%
Western Pattern. . . . . 60&10%
Handy Trucks. . . . . ℔ doz. $16.00
Grocery . . . . . ℔ doz $15.00
McKinney Trucks. . . . . each, net $10.00
Model Stove Trucks. . . . . ℔ doz $18.50

Tubs, Wash—

M'f'gr's list, price per gross.

No.	0	1	2	3
Galvanized	$67	$79	$91	$103

10&7½&5&5%

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls . 21@23¢
No. 12, ¼ and ½-lb. Balls . 19@21¢
No. 18, ¼ and ½-lb. Balls . 16@18¢
No. 24, ¼ and ½ -lb. Balls . 15½@17½¢
No. 36, ¼ and ¼-lb. Balls . 15@17¢
Chalk Line, Cotton ¼-lb. Balls . . . . . 24@29¢
Cotton Mops, 8, 9, 12 and 15 lb. to doz. . . . . 8½@19¢
Cotton Wrapping, 5 Balls to lb., according to quality . 13½@19¢
American 2-Ply Hemp, 1-lb. Balls. . . . . 12½@15¢
American 3-Ply Hemp, 1-lb Balls . . . . . 13½@16¢
India 2-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine) . . . 7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7½@9¢
India 2-Ply Hemp, 1½-lb. Balls, 7@8½¢
2, 3, 4 and 5-Ply Jute, 1½-lb. Balls . . . . . 9@11¢
Mason Line, Linen, ½-lb. Bls. 17¢
No. 2½ Mattress, ¼ and ½ lb. Balls, according to quality. 30@60¢
Wool, 3 to 6 ply . . . . B 6¢; A 7½¢

Vises—

Solid Box . . . . . 60@60&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable. 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co., 40&5%;
Slide 65%
Fisher & Norris Double Screw, net, each Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00.
Fulton Mach. & Vise Co.:
F. & R. Double Swivel Machinists' 40%
Star, Solid Jaw, Machinists' 40%
Hollands':
Machinists' . . . . . 40@40&5%
Keystone . . . . . 65&5@70%
Lewis Tool Co.:
Adjustable Jaw. 30%
Monarch, 50%; Solid Jaw. 30%
Massey Vise Co.:
Clincher 40%
Parallel Bar. 15%
Perfect, 15%; Lightning Grip. 15%
Merrill's 25%
Millers Falls Oval Slide Pattern. 60&10%
Parker's:
Victor, 20@25%; Regulars. . . . 20@25%
Vulcan's . . . . . 40@45%
Combination Pipe. . . . . 55@60%
Prentiss . . . . . 20@25%
Rock Island. 25%
Snediker's X. L. 33⅓%
Stephens' 33⅓%

Saw Filers

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps. 30%
Perfection Saw Clamps, ℔ doz. . . . $4.50
Reading 60%

Wood Workers—

Fulton Mach. & Vise Co.:
F. & R. Double Swivel Coachman's 40%
Star Solid Jaw Woodworkers' 60%
Massey Vise Co.:
Lightning Grip, 15%; Perfect. . . . 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Fulton Machine & Vise Co., Combination Pipe. 70%
Holland's Combination Pipe. . 60@60&5%
Massey's Quick Action Pipe. 40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Rock Island Pipe. 25%

Wads—*Price per M.*

B. E., 11 up . . . . . 60¢
B. E., 9 and 10 . . . . . 70¢
B. E., 8 . . . . . 80¢
B. E., 7 . . . . . 80¢
P. E., 11 up $1.00
P. E., 9 and 10 . . . . . 1.25
P. E., 8 . . . . . 1.50
P. E., 7 . . . . . 1.50
Ely's B. E., 11 and larger. $1.70@1.75
Ely's P. E., 12 to 20 . . . . $3.00@3.25

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled . . . . . 45&10%
Ground . . . . . 50&5%
Plain or Unground 60%
Country Hollow Ware, per 100 lbs . . . . . $2.75@$3.00
White Enameled Ware:
Maslin Kettles . . . . . 65&10%
Covered Wares:
Tinned and Turned . . . . . 35&10%
Enameled . . . . . 45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware. 33⅓%
El-an-ge . . . . . 60&10%
Iron Clad Ware. . . . . 70&10%
Lava and Volcanic, Enameled. 40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles . . . . . 65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd. 60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles . . . . . 65&5%
Solid Steel Kettles. . . . . 60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone. . . . 40@40&10%

Washboards—

No.	℔ doz.
800—Brass King, Single Surface, Open Back	$2.80
882—White Hen, Spiral Grimp Glass	$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.35
172—Our Best, Single Zinc, Soap Drainer	$3.35
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back	$2.80
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
797—Jewel, Single Zinc, Pail Size.	$1.25

St. Louis Washboard Co.
Ben Hur, Brass, Open Back. $2.50
Brass Key, Open Back. $2.75

Washers—Leather, Axle—

Solid . . . . . 90@90&10%
Patent . . . . . 90@90&5%
Coil: ⅞ 1 1¼ 1½ *inch.*
9¢ 10¢ 11¢ 14¢ *per box.*

Iron or Steel—

Size bolt . . . . 5-16 ⅜ ½ ⅝ ¾
Washers $4.90 4.00 2.70 2.50 2.80
The above prices are based on $6.50 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 ℔ kegs, $6.00 ℔ 100 ℔. discl.; in 100 ℔ kegs add 10¢ net ℔ 100 ℔; in 5 or 10 ℔ boxes, add 50¢ net ℔ 100 ℔; in 1 ℔ boxes, add $1.00 net ℔ 100 ℔.

Cast Washers—

Over ½-inch, barrel lots. per lb. 1½@1¾¢

Wedges—

Oil Finish . . . . . lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co. . . . . 30&2%

Sash—

Per net ton . . . . . $19.50@$21.00

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 . . . . . 72½&10&7½%
10 to 18 . . . . . 72½&10&10%
19 to 26 . . . . . 75&10&10&2½%
27 to 36 . . . . . 77½&7½%
Galvanized:
6 to 9 . . . . . 72½&10%
10 to 14 . . . . . 72½&10&5%
15 to 16 . . . . . 72½&10&5%
17 to 18 . . . . . 72½%
19 to 26 . . . . . 70&5&2½%
27 to 36 . . . . . 65&10&10%
Coppered:
6 to 9 . . . . . 65&10&10%
10 to 14 . . . . . 70&10&5%
15 to 18 . . . . . 65&10&10&10%
19 to 26 . . . . . 70&5&2½%
27 to 36 . . . . . 72½&10&2½%
Tinned:
6 to 18 . . . . . 67&10&10%
Brass . . . . . 15¾¢ lb., base
Copper . . . . . 15¼¢ lb., base
Cast Steel Wire 50%

Spooled Wire—

Annealed and Tinned. 75@75&10%
Brass and Copper . . . . 70@70&10%
Retailers' Assortments, per box, $1.90@$2.10
Wire Clothes Line, See Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Steel Wire Goods . . . . . 90&10%
Brass Wire Goods . . . . . 90&10%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10@80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50.
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh $2.75
Nos. 4 and 5 Mesh $3.00
No. 6 Mesh $3.25
Nos. 7 and 8 Mesh $3.75

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural . . . . 80&10@80&10&5%
Alligator or Crocodile. 70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S . . . . . 45@45&5%
Acme . . . . . 60&10%
Alligator Pattern, 70%; Bull Dog. 70%
Bemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut. . . . . 50&5%
Combination Black. . . . . 50&5%
Merrick Pattern. . . . . 50&5%
Boardman's 40%
Coes' Genuine Knife Hdl. . . 40&10&5&5%
Coes' Genuine Steel Hdl. . . 40&10&5&5%
Coes' Genuine Key Model. . 40&10&5&5%
Coes' Genuine Hammer Handle. . . . . 40&10&5&5%
Coes' "Mechanics'". . . 40&10&10&5&5%
Donohue's Engineer. . . . . 40&10%
Eagle 70%
Gem Pocket. 30%
Hercules 70%
W. & B. Machinist:
Case lots. . . . . 50&10%
Less than case lots. 50%
W. & B. Railroad Special:
Case lots. 50%
Less than case lots. . . . . 40&10&5%
Solid Handles, P., S. & W. 50&10%; full cases. . . . . 50&10&5%
Standard Nipple Mfg. Co.:
Duplex Chain. 50%
Uwanta Wrench Co.:
Uwanta Special, Iron Handle. . . . . 40&10&5%
Other Wrenches. 50%
Vulcan and Agrippa Chain. . . . 50%
Whitaker Machinists'. . . . . 50&10%
Wizard Adjustable Ratchet. 50%

Fruit Jar—

Beni, P. Forbes, Triumph, ℔ gro., $7.50; per doz. $0.90

Wrought Goods—

Staple Hooks, &c., list March 17, '02 . . . . . 90@—%

Zinc— (*Cask lots at mill.*)

Sheet . . . . . per 100 lb., $6.75